ORP/OSR-2001-11
Revision 0

SAFETY EVALUATION REPORT OF CONTRACTOR'S LIMITED CONSTRUCTION AUTHORIZATION REQUEST (LCAR)

August 15, 2001

Office of Safety Regulation

U.S. Department of Energy
Office of River Protection
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PREFACE

As directed by Congress in Section 3139 of the *Strom Thurmond National Defense Authorization Act for Fiscal Year 1999,* the U.S. Department of Energy (DOE) established the Office of River Protection (ORP) at the Hanford Site to manage the River Protection Project (RPP), formerly known as the Tank Waste Remediation System. ORP is responsible for the safe storage, retrieval, treatment, and disposal of the high level nuclear waste stored in the 177 underground tanks at Hanford.

The initial concept for treatment and disposal of the high level wastes at Hanford was to use private industry to design, construct, and operate a Waste Treatment Plant (WTP) to process the waste. The concept was for DOE to enter into a fixed-price contract for the Contractor to build and operate a facility to treat the waste according to DOE specifications. In 1996, DOE selected two contractors to begin design of a WTP to accomplish this mission. In 1998, one of the contractors was eliminated, and design of the WTP was continued. However, in May 2000, DOE chose to terminate the privatization contract and seek new bidders under a different contract strategy. In December 2000, a team led by Bechtel National, Inc. was selected to continue design of the WTP and to subsequently build and commission the WTP.

A key element of the River Protection Project Waste Treatment Plant (RPP-WTP) is DOE regulation of safety through a specifically chartered, dedicated Office of Safety Regulation (OSR). The OSR reports directly to the ORP Manager. The regulation by the OSR is authorized by the document entitled *Policy for Radiological, Nuclear, and Process Safety Regulation of the River Protection Project Waste Treatment Plant Contractor* (DOE/RL-96-25) (referred to as the Policy) and implemented through the document entitled *Memorandum of Agreement for the Execution of Radiological, Nuclear, Process Safety Regulation of the RPP-WTP Contractor* (DOE/RL-96-26) (referred to as the MOA). These two documents provide the basis for the safety regulation of the RPP-WTP at Hanford.

The foundation of both the Policy and the MOA is that the mission of removal and immobilization of the existing large quantities of tank waste by the RPP-WTP Contractor must be accomplished safely, effectively, and efficiently.

The Policy maintains the essential elements of the regulatory program established by DOE in 1996 for the privatization contracts. The MOA clarifies the DOE organizational relationships and responsibilities for safety regulation of the RPP-WTP. The MOA provides a basis for key DOE officials to commit to teamwork in implementing the policy and achieve adequate safety of RPP-WTP activities.

The Policy, the MOA, the RPP-WTP Contract, and the four documents incorporated in the Contract define the essential elements of the regulatory program being executed by the OSR. The four documents incorporated into the Contract (and also in the MOA) are as follows:

Concept of the DOE Process for Radiological, Nuclear, and Process Safety Regulation of the RPP Waste Treatment Plant Contractor, DOE-96-0005,

DOE Process for Radiological, Nuclear, and Process Safety Regulation of the RPP Waste Treatment Plant Contractor, DOE/RL-96-0003,

Top-Level Radiological, Nuclear, and Process Safety Standards and Principles for the RPP Waste Treatment Plant Contractor, DOE/RL-96-0006, and

Process for Establishing a Set of Radiological, Nuclear, and Process Safety Standards and Requirements for the RPP Waste Treatment Plant Contractor, DOE/RL-96-0004.

DOE patterned its safety regulation of the RPP-WTP Contractor to be consistent with the concepts and principles of good regulation (reliability, clarity, openness, efficiency, and independence) used by the Nuclear Regulatory Commission (NRC). In addition, the DOE principles of integrated safety management were built into the regulatory program for design, construction, operation, and deactivation of the facility. The regulatory program for nuclear safety permits waste treatment services to occur on a timely, predictable, and stable basis, with attention to safety consistent with that which would occur from safety regulation by an external agency. DOE established OSR as a dedicated regulatory organization to be a single point of DOE contact for nuclear safety oversight and approvals for the WTP Contractor. The OSR performs nuclear safety review, approval, inspection, and verification activities for ORP using the NRC principles of good regulation while defining how the Contractor shall implement the principles of standards-based integrated safety management.

A key feature of this regulatory process is its definition of how the standards-based integrated safety management principles are implemented to develop a necessary and sufficient set of standards and requirements for the design, construction, operation, and deactivation of the RPP-WTP facility. This process meets the expectations of the DOE necessary and sufficient closure process (subsequently renamed Work Smart Standards process) in DOE Policy 450.3, *Authorizing Use of the Necessary and Sufficient Process for Standards-based Environment, Safety and Health Management*, and is intended to be a DOE approved process under DOE Acquisition Regulations, DEAR 970.5204-2, *Laws, Regulations and DOE Directives,* Section (c). DOE approval of the contractor-derived standards is assigned to the OSR.

The RPP-WTP Contractor has direct responsibility for WTP safety. DOE requires the Contractor to integrate safety into work planning and execution. This integrated safety management process emphasizes that the Contractor's direct responsibility for ensuring that safety is an integral part of mission accomplishment. DOE, through its safety regulation and management program, verifies that the Contractor achieves adequate safety by complying with approved safety requirements.

RECORD OF REVISION

Document Title: Safety Evaluation Report of Contractor's Limited Construction Authorization Request (LCAR)

Document Number: ORP/OSR-2001-11

Revision Date	Revision Number	Reason for Revision
8/15/01	0	New Issue

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EXECUTIVE SUMMARY

On June 5, 2001, Bechtel National, Inc. (BNI), submitted a Limited Construction Authorization Request (LCAR) to the U.S. Department of Energy (DOE), Office of River Protection (ORP), Office of Safety Regulation (OSR) for review and approval. The LCAR includes activities to prepare the site, complete major excavation, place mud mats, and prepare temporary and permanent facilities needed to support construction of primary process facilities. Important-to-safety activities included in the LCAR are limited to control of survey activities, inspection of subgrade compaction for the primary process facilities, and receipt and storage of important-to-safety items. Primary process facilities include pretreatment, low-activity waste (LAW) pretreatment, high-level waste vitrification, and LAW vitrification.

Activities planned during limited construction either support or do not affect the safety requirements of the completed facility. Work will be performed under an approved Radiological Protection Program that provides measures for managing potential exposure scenarios involving radioactive material and radiation encountered during construction activities.

Reviewers concluded that performance of activities proposed by the LCAR pose minimal commercial risk and no safety risk to the project. During limited construction, the contractor has proposed some important-to-safety work and has committed to apply, as imposed by the DOE approved BNI Quality Assurance (QA) Manual, the appropriate QA requirements in performing that work.

This Safety Evaluation Report concludes that the limited construction proposed by the Contractor adequately protects the public, co-located workers, workers, and the environment. It is recommended that limited construction be authorized after completion of the following:

- Verification that procedures and other commitments made in the LCAR have been prepared or completed and the Contractor team is familiar with them; the OSR plans to verify these commitments in an LCA Readiness Inspection, presently scheduled for August 2001.

- Revising the LCAR to include additional details and clarifications provided in response to OSR questions.

In parallel with OSR preparation of the LCA Agreement, ORP is preparing to issue a limited construction notice to proceed. This notice will include ORP's determination concerning whether the work proposed is in the best interests of DOE and verification that required permits and National Environmental Protection Act documentation are in place.

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SAFETY EVALUATION REPORT OF CONTRACTOR'S LIMITED CONSTRUCTION AUTHORIZATION REQUEST (LCAR)

1.0 INTRODUCTION

This document discusses the process that the U.S. Department of Energy (DOE), Office of River Protection (ORP), Office of Safety Regulation (OSR) used to evaluate and approve the River Protection Project-Waste Treatment Plant (RPP-WTP) Contractor's Limited Construction Authorization Request (LCAR). The RPP-WTP Contract[1] allows the Contractor to request Limited Construction Authorization (LCA) for site preparation and excavation and other activities, as mutually agreed upon. On March 9, 2001, the Contractor notified the DOE of its intent to submit an LCAR to the OSR on April 27, 2001, to support receipt of the LCA by September 27, 2001.[2] On April 12, 2001, the Contractor notified DOE of a change in the submittal date for the LCAR to June 5, 2001.[3] This date change was accepted by the OSR.[4]

The Contractor submitted its LCAR to the OSR on June 5, 2001,[5] and provided updated drawings to the OSR on June 7, 2001.[6] The OSR subsequently reviewed and evaluated the LCAR submittal against the approval criteria outlined in RL/REG-99-17, *Review Guidance for the Limited Construction Authorization Request (LCAR)*. The review team's evaluation, conclusions, and recommendations to the Safety Regulation Official (SRO) for the LCA are presented in this document. Results of the review and evaluation are discussed in Section 3.0 of this Safety Evaluation Report (SER).

The Contractor proposed the following activities during limited construction related to its overall facilities. Unless noted, the activity is not designated as important-to-safety. Preconstruction of primary process facilities includes the following activities:

- Grading, surveying, and clearing and grubbing the site (survey control is important-to-safety)

- Installing soil retention sheet piles for pretreatment, low-activity waste (LAW) pretreatment, and high-level waste (HLW) vitrification base slab foundations

[1] Contract No. DE-AC27-01RV14136 between DOE and BNI, dated December 11, 2000.
[2] CCN: 019990, BNI letter, R. Naventi to W. Taylor, ORP "Intent to Submit Limited Construction Authorization Request for the River Protection Project Waste Treatment Plant," dated March 9, 2001.
[3] CCN: 019345, BNI letter, R. Naventi to W. Taylor, ORP, "Limited Construction Authorization Request for the River Protection Project Waste Treatment Plant Submittal Date Extension," dated April 12, 2001.
[4] 01-OSR-0135, ORP letter, M. Barrett to R. Naventi, BNI, "Office of River Protection Approval of Bechtel National, Inc. Request for an Extension for Submittal of the Limited Construction Authorization Request," dated April 16, 2001.
[5] CCN: 020503, BNI letter, A. Veirup to M. Barrett, ORP, "Request for Review and Approval of the Limited Construction Authorization Request for the River Protection Project," dated June 5, 2001.
[6] CCN: 020564, BNI letter, A. Veirup to M. Barrett, ORP, "Updated Drawings for Use in Review and Approval of the Limited Construction Authorization Request for the River Protection Project-Waste Treatment Plant," dated June 7, 2001.

- Excavating the main foundation for the primary processing facility
- Inspecting subgrade compaction (important-to-safety)
- Placing mud mats
- Preassembling stainless steel liners (deleted from LCAR scope on July 3, 2001[7]).

Installation of permanent facilities includes the following activities:

- Installing site perimeter electrical grounding
- Excavating, installing, testing, and temporarily commissioning portions of the underground fire water system
- Excavating for and installing underground utilities for raw water, potable water, permanent power, site drainage, compressed air, and cathodic protection
- Installing permanent facility fencing
- Constructing the administration building
- Installing the permanent sanitary waste system
- Constructing the site road
- Constructing the main construction warehouse
- Receiving and storing construction materials (some important-to-safety materials will be received and stored during limited construction).

Temporary facilities include the following activities:

- Installing temporary sanitary waste facilities
- Setting up first aid, emergency response, and fire protection trailers
- Installing construction site security systems
- Installing and qualifying the concrete batch plant (quality-related procurement for qualification and production processes)
- Setting up trailers for temporary site offices

[7] CCN: 021158, BNI letter, A. Veirup to M. Barrett, ORP, "Responses to the U.S. Department of Energy, Office of Safety Regulation's Questions on the Limited Construction Authorization Request," dated July 3, 2001.

- Setting up fabrication shops, material/equipment laydown areas, and change rooms
- Installing construction power, water, and communication systems
- Procuring a civil testing laboratory facility (quality-related procurement for testing services)
- Disposing construction waste and trash
- Installing construction fencing, parking, and main field office
- Setting up the timekeeper's trailer and entry turnstiles
- Installing tool cribs
- Installing area and security lighting
- Mobilizing construction heavy equipment.

The Contractor also requested authorization to remediate small quantities of contamination and waste encountered during limited construction.

2.0 REVIEW PROCESS

This section describes the process OSR used to review the LCAR submittal. The LCAR was reviewed as part of the construction authorization process outlined in DOE/RL-96-0003, *DOE Process for Radiological, Nuclear, and Process Safety Regulation of the RPP Waste Treatment Plant Contractor*.[8] The purpose of the LCAR review was to approve the Contractor's proposed limited construction activities to enable an early start for site preparation and excavation. The review provides assurance that the LCA activities proposed by the Contractor will be conducted in a manner that protects the safety of the workers and the public and that the work will be performed consistent with the approved Safety Requirements Document (SRD) and Integrated Safety Management Plan (ISMP). The review process was based on RL/REG-99-17.

2.1 LCAR Review Approach

The reviewers evaluated the material submitted by the Contractor against the approval criteria listed in RL/REG-99-17. The review consisted of: (1) an acceptability review conducted during the first week after the LCAR was submitted to determine if the submittal was acceptable for detailed review and (2) the detailed review, which was conducted during the following six weeks.

[8] DOE/RL-96-0003, *DOE Process for Radiological, Nuclear, and Process Safety Regulation of the RPP Waste Treatment Plant Contractor,* Section 3.3.3, "Authorization for Construction," and Section 4.3, "Authorization for Construction."

The review focused on the Contractor's readiness to perform the proposed limited construction activities identified in the submittal, including the following specific components:

- A detailed description of the activities proposed, including a listing of which LCA activities were considered important-to-safety or potentially important-to-safety
- A clear explanation of the need for these activities and the associated benefits to DOE
- A discussion of the safety criteria that were applied to the activities
- An analysis of uncertainties in the current civil/structural design as related to the requested activities
- Confirmation that procedures necessary to perform the requested LCA activities were approved and available for use before the start of limited construction (procedures were not required to be submitted to the OSR with the LCAR)
- Confirmation that the quality assurance (QA) requirements applicable to the requested limited construction activities were established and approved
- Confirmation that the radiation protection requirements applicable to the requested limited construction activities were established and approved
- An event logic network with narrative explanation of the critical path for the limited construction activities
- A description of the permits required for limited construction activities.

When the LCAR was received from the Contractor, the OSR reviewed it for completeness and adequacy and accepted the package for detailed review.[9]

For the detailed review, the OSR performed the following activities:

- Completed the review according to the guidance document (RL/REG-99-17).
- Prepared and maintained a public record file that contained the information that formed the basis for the review findings. The file included correspondence pertinent to the basis for the review findings.
- Requested additional information from the Contractor through formally submitted questions to clarify the submittal.[10]

[9] 01-OSR-0214, ORP letter, R. Barr to R. Naventi, BNI, "Office of Safety Regulation Acceptance of Limited Construction Authorization Request for Detailed Review," dated June 7, 2001.
[10] 01-OSR-0224, ORP letter, R. Barr to R. Naventi, BNI, "Office of Safety Regulation Questions on the Limited Construction Authorization Request," dated June 19, 2001.

- Prepared a draft SER.
- Issued the final SER.

2.2 LCAR Review Chronology

The review process began on June 5, 2001, with receipt of the LCAR from the Contractor. In accordance with the criteria in RL/REG-99-17, the OSR completed the acceptability review on June 7, 2001, and notified the Contractor in writing that the submittal was acceptable for detailed review. The LCAR was made available for public comment on June 12, 2001.

The OSR review team began the detailed review on June 12, 2001, and submitted questions to the Contractor on June 19, 2001. The Contractor formally responded to the questions on July 3, 2001,[11] July 19, 2001,[12] and July 26, 2001.[13] The OSR questions and Contractor responses are provided in the Appendix of this document. The reviewers found the responses to these questions acceptable. No public comments were received on the LCAR.

2.3 Team Composition and Expertise

The review team's composition and expertise are shown in Table 1. The OSR Safety and Standards Review Official (L. Miller) led the review team. Mr. R. Gilbert was the Deputy Team Leader.

Table 1. Review Team Membership Education and Experience

LCAR Review Team Member	Education and Experience
Mike Black	B.S. Geological Engineering, University of Idaho. Over 28 years experience in ground support and excavation, including both mining and civil applications. Experience with drill and blast, ripping, scrapers, power shovels, and front-end loaders on jobs ranging from striping operations for open pit mining to basement excavations for residential homes.
Pat Carier	B.S. Mechanical Engineering, Penn State University; Master's in Management, University of Phoenix. OSR Verification and Confirmation Official. Senior reactor Operator Certification; QA training and facilitating. More than 16 years experience in nuclear power licensing and system integration, regulatory affairs, and QA.

[11] CCN: 021158, BNI letter, A. Veirup to M. Barrett, ORP, "Responses to the U.S. Department of Energy, Office of Safety Regulation's Questions on the Limited Construction Authorization Request," dated July 3, 2001.
[12] CCN: 021299, BNI letter, A. Veirup to M. Barrett, ORP, "Response to U.S. Department of Energy, Office of Safety Regulation Question 01-LCAR-008 on the Limited Construction Authorization Request," dated July 19, 2001.
[13] CCN: 021691, BNI letter, A. Veirup to M. Barrett, ORP, " Supplement to Response to U.S. Department of Energy, Office of Safety Regulation Question 01-LCAR-001 on the Limited Construction Authorization Request," dated July 26, 2001.

LCAR Review Team Member	Education and Experience
Ko Chen	B.S. Chemical Engineering, National Taiwan University; Ph.D. Mechanical Engineering, University of California Berkeley. Licensed Mechanical Engineer. More than 20 years experience in nuclear safety, fluid mechanics, mass transfer, and heat transfer.
Rick Garrison	B.S. Electrical Engineering, Washington State University. More than 15 years experience in design, installation, startup, operations, and maintenance of instrumentation, control, power, and data management systems.
Yvonne Gibbons	B.S. Civil Engineering, Arizona State University; M.S. Civil Engineering, Old Dominion University. More than 10 years experience in foundation design, geotechnical investigations and analysis, environmental investigations and analysis, slope stability analysis, and seismic analysis.
Rob Gilbert	B.S. Metallurgical Engineering, University of Washington. Five years Nuclear Navy, and 10 years experience in waste vitrification technology and design, Hanford tank waste storage and treatment system design, and pressure vessel steel material performance.
Robert Griffith	B.S. Mechanical Engineering, University of Arizona; M.S. Mechanical Engineering, Stanford University. Registered Professional Engineer. More than 26 years experience in systems engineering, licensing support, safety engineering, and environmental qualification at DOE, commercial power plants, and the Savannah River Site.
Francis Han	B.S. Civil Engineering, North Dakota State University; M.S. Civil Engineering, Polytechnic University of New York. More than 30 years experience in structural design and construction of commercial nuclear plants, government nuclear plants, and waste treatment facilities.
Al Hawkins	B.S. Chemical Engineering, University of Washington; MBA, Operations Research, Washington State University. OSR Openness Coordinator. More than 27 years experience in operations, oversight, safety, and QA. Former manager of Compliance Assurance and Director of Environment, Safety, Health and Quality Assurance.
Neal Hunemuller	B.S. Nuclear Engineering, Iowa State University. Certified U.S. Nuclear Regulatory Commission (NRC) Operator Licensing Examiner; Licensed NRC Senior Operator; NRC-certified Incident Investigation Team Member. More than 20 years experience in commercial nuclear power and the NRC. Expertise in standards identification process, conformance/compliance reviews, and training and qualifications.
Ninu Kaushal	B.A., B.S., and M.S. in Physics, Punjab University; MBA Northern Illinois University; Ph.D. Nuclear Physics, Rensselaer Polytechnic Institute. More than 20 years experience in the commercial nuclear industry in nuclear physics, nuclear safety evaluations, nuclear criticality, electrical design, and instrument and controls; 10 years experience in nuclear research applying state-of-the-art instrumentation techniques.
Bill Kennedy	B.S. Nuclear Engineering, Kansas State University; M.S. Nuclear Engineering, Kansas State University. Over 25 years experience in environmental and health physics. Nationally and internationally recognized expert in environmental radiological controls, environmental assessment, environmental regulations, radiation dosimetry, environmental pathway analysis, safety assessment and risk analysis, radiation shielding, health physics, and statistical analysis.

LCAR Review Team Member	Education and Experience
Dennis Kirsch	B.S. and M.S. Electrical Engineering, Montana State University. Registered Professional Engineer. More than 23 years with the NRC including position as Division Director of Reactor Safety and Projects; 5 years commercial experience. Expertise in mechanical and electrical construction inspection, power reactor operations, QA, and preoperational testing of mechanical and electrical systems.
Ron Lerch	B.A. Chemistry, Pacific Lutheran University; Ph.D. Inorganic Chemistry, Oregon State University. More than 30 years experience in nuclear waste management, nuclear technology development, nuclear fuel reprocessing, environmental cleanup, and project management; 2 years as Deputy Manager of Hanford tank farms.
Lew Miller	B.S. Physics, Massachusetts Institute of Technology; M.S. Nuclear Engineering Science, University of California Berkeley. OSR Safety and Standards Review Official. Certified license examiner, senior resident inspector. More than 25 years experience with Nuclear Navy and NRC. Expertise in nuclear safety oversight, safety analysis reviews assessments, and incident investigations.
Jeanie Polehn	B.S. Nuclear Engineering Technology, Oregon State University; M.S. Health Physics, Georgia Technical Institute. Certified health physicist. More than 20 years experience in radiation protection including occupational, environmental, and emergency response at commercial power plants and with DOE.
Ken Scown	B.S. Management Science, California State University Hayward. Over 18 years nuclear fire protection auditing and consulting, including inspections for fire protection, emergency planning, and security. Worked 7 years fighting fires, servicing equipment, and training fire fighters; worked 6 years as a health and safety technician.
Joe Yedidia	B.S. Mechanical Engineering, Israel Institute of Technology; M.S. Nuclear Science, Israel Institute of Technology; MBA, University of Pittsburgh. Over 30 years experience in spent fuel systems, reactor utility requirements, liquid metal reactor development, and mechanical and fluid reactor systems.

3.0 EVALUATION

The review described in this section was performed to provide a basis for the SRO to make a determination and recommendation on approval or disapproval of the LCAR to the ORP Manager. To facilitate the determination, the review was structured around the following eight program elements:

- Section 3.1 - Programmatic and Safety Review
- Section 3.2 - Facility Description
- Section 3.3 - Management Control Systems
- Section 3.4 - Environmental Radiological Protection
- Section 3.5 - Contractor's Technical and Experience Qualifications to Conduct Limited Construction

- Section 3.6 - Radiation Protection Program
- Section 3.7 - Approach to Implement the Construction and Preoperational Portions of the SRD and ISMP
- Section 3.8 - SRD and ISMP Acceptability and Compliance.

The information addressed during the review consisted of the LCAR submitted by the Contractor and the written responses received from the Contractor to specific OSR questions. For each of the eight program elements, the following sections describe the purpose of the review, the requirements, the review methodology, and a summary of the reviewers' evaluation of the Contractor's submittal for the element.

3.1 Programmatic and Safety Review

The purpose of this review was to ensure that, during the LCA work activities, controls are provided to ensure adequate safety of workers and the public and to determine whether the Contractor has adequately explained the need for the LCA, including its associated benefits to DOE. This review considered the potential costs of reworking completed installations due to uncertainties and changes in the design.

3.1.1 Requirements

The reviewers were asked to determine whether the Contractor's submittal provided the following:

1. Confirmation that the activities covered by the LCA provide adequate safety for workers, the public, and the environment
2. Clear justification of the need for the LCA
3. An event logic network relating the proposed limited construction activities to follow-on construction work
4. Sufficient basis for identifying and classifying important-to-safety structures, systems, and components (SSCs) to be installed under the LCA and the associated quality requirements
5. Consistency between the limited construction activities proposed by the Contractor relative to the site description and the most recent environmental impact statement (EIS) and the relevant supplemental analysis
6. Demonstration that the limited construction activities are compatible with the overall design.

3.1.2 Review Methodology

The reviewers evaluated the Contractor's submittal on the programmatic and safety benefits of doing limited construction in advance of the Construction Authorization Agreement to ensure that the benefits to DOE were such that limited construction should be authorized and that adequate safety would be provided during limited construction. The reviewers also assessed the event logic network tying the limited construction activities to the follow-on construction activities and the basis used to identify and classify important-to-safety SSCs to be installed during limited construction.

3.1.3 Evaluation

The reviewers evaluated the Contractor's submittal on the programmatic and safety benefits of limited construction and found that all six requirements in Section 3.1.1 were met. Items 3, 4, and 6 required supplemental information in response to OSR questions to reach the conclusion that they were acceptable. The evaluation of each of the six requirements is discussed below.

1. In Section 1 of the LCAR, the Contractor stated that activities proposed for installation either support or do not affect the safety requirements of the completed facility. Work during limited construction will be performed in a manner that ensures radiological, nuclear, and process safety of workers, co-located workers, and the public. Section 4 of the LCAR committed to performing activities in compliance with a DOE-approved Radiological Protection Program. Also, because of the potential for encountering legacy radioactive material during construction activities, a radiological monitoring program would be implemented to ensure site personnel and public radiological safety. These commitments were acceptable to the reviewers.

2. The Contractor requested approval to prepare the site, complete major excavation, place mud mats, and begin construction of temporary and permanent facilities needed to support construction of the primary processing facilities. The Contractor stated that performing these activities ahead of construction authorization was essential to begin construction as scheduled and to support the start of hot commissioning in 2007. The reviewers found the justification for the LCA acceptable.

3. The Contractor's initial submittal did not provide an event logic network. In response to a formal OSR question (see question 01-LCAR-007-Q in the Appendix), the Contractor provided an event logic network that related proposed limited construction activities to follow-on construction work. Certain activities, such as construction of the administration building, were justified as efficient use of resources during limited construction with potential project cost savings. This response was acceptable to the reviewers and met the requirement.

4. The Contractor provided sufficient basis to identify and classify important-to-safety SSCs for all proposed limited construction activities with one exception. The rationale for concluding that preassembly of stainless steel liners was not important-to-safety, based on integrated safety management (ISM) assessments performed, required further explanation. The Contractor subsequently eliminated preassembly of stainless steel liners

from the LCAR scope. In response to OSR question 01-LCAR-025-Q, the Contractor stated that the conclusion that an item was not important-to-safety was reached if the item was not associated with any control strategy identified during ISM assessments performed. This response was acceptable to the reviewers.

5. The Contractor stated in Section 1 of the LCAR that no inconsistencies were identified relative to the proposed limited construction activities and the most recent RPP EIS. The Contractor indicated that aggregate may be obtained from Pit 30. National Environmental Protection Act analysis for potential use of aggregate from Pit 30 is planned by DOE and is under the management of the Office of River Protection's (ORP's) Assistant Manager for Safety Quality and Health (AMSQ). The reviewers concluded that this analysis must be completed prior to use of Pit 30 aggregate. Compliance with NEPA requirements will be confirmed in the ORP limited construction notice to proceed.

6. The LCAR is based on the current facility baseline. The Contractor anticipates the site layout and primary processing facility configuration will change from that described in the LCAR. OSR question 01-LCAR-008-Q addressed the specific actions that will be taken to revise the project baseline and obtain approval of necessary authorization basis changes. The Contractor stated that project changes will be processed according to project change control procedures and that authorization basis changes will be processed according to RL/REG-97-13, *Office of Safety Regulation Position on Contractor-Initiated Changes to the Authorization Basis*. This response was acceptable to the reviewers. This SER evaluated the specific site layout and design included in the LCAR; future changes will require supplemental review prior to their implementation.

3.1.4 Conclusions

The reviewers concluded that adequate safety would be achieved during LCA activities. Before construction authorization is approved, LCA activities can be performed safely and are expected to not significantly impact the safety of workers, co-located workers, the public, and the environment. This determination will be reevaluted in greater detail for the construction authorization and operating authorization reviews required by Contract as the design and associated safety analyses matures. Performing LCA activities will help initiate construction on the primary process facilities and will increase the probability of initiation of hot commissioning in 2007. This conclusion applies to the specific activities described in the LCAR. Future changes to LCA activities must be provided to the OSR for review and approval. Associated changes to the authorization basis must be submitted according to RL/REG-97-13.

3.2 Facility Description

The purpose of this review was to determine whether the Contractor's submittal adequately described the facility features encompassed by the limited construction activities that could affect potential accidents and their consequences. Examples of these features were facility location, facility design information, and building location and arrangement on the facility site.

3.2.1 Requirements

Standard 7, Item (e)(2)(x), of the Contract allows the Contractor to request LCA for site preparation and excavation and other activities, as mutually agreed to. The request must include a description of the facility features that could affect potential accidents and their consequences.

The requirements for facility features are found in Section 4.3 of DOE/RL-96-0003, which requires that the Contractor provide a description of the facility SSCs, including those designated as important-to-safety.

The Contractor's SRD contains additional applicable requirements. SRD Safety Criterion 4.1-2 addresses SSCs designated as important-to-safety and provides requirements that they be designed, fabricated, erected, constructed, tested, inspected, and maintained to quality standards commensurate with the important-to-safety functions to be performed. SRD Safety Criterion 4.1-3 addresses natural phenomena hazards (NPHs) design for SSCs that are important-to-safety and have NPH safety functions, such as the ability to withstand the effects of earthquakes, wind, floods, missiles, and volcanic ash and snow loading. Safety Criterion 4.1-4 addresses NPH design for SSCs that are important-to-safety without NPH safety functions.

3.2.2 Review Methodology

The reviewers evaluated the Contractor's description of facility features that could affect important-to-safety SSCs and any safety functions that depended on site preparation and excavation. The submittal was reviewed for the following specific important-to-safety features:

1. The facility location and the distance from the site boundary in all directions, including the distance to the nearest resident

2. The layout and location of buildings on the facility site, including scaled drawings showing the plant layout; plant structural features such as buildings, towers, tanks, and transportation right-of-ways; and the relationship of specific facility layout features to the major processes that will be ongoing at the facility

3. The footprints and elevations of the compacted subgrades for the proposed buildings

4. The excavation related to the fire protection system to be installed during limited construction activities to ensure that the installed underground portions of the system meet seismic requirements. The system performance requirements related to the excavation were evaluated. The reviewers evaluated the submittal for objective evidence that appropriate quality has been, or will be, applied to the design, construction, installation, and testing of the underground fire water system to meet the corresponding SRD requirements.

5. Objective evidence that the duct banks for important-to-safety SSCs conform to design drawings and meet applicable requirements, including seismic. The objective evidence included an appropriate level of inspection and verification by the Contractor.

6. The detailed plans for inspecting and verifying that the concrete batch plant meets the ACI-318 certification activities

7. The laydown area for storing important-to-safety SSCs to ensure that it meets the requirements of the Contractor's Quality Assurance Manual (QAM) and the ISMP

8. The civil testing laboratory to ensure that it is capable of repeatedly and reliably performing tests to verify that important-to-safety attributes, such as soil density/compaction ratio and moisture content, conform to design requirements

9. The excavation-related design of important-to-safety buildings to ensure that the excavation is acceptable, including a description of the backfill compaction criteria, pile location, and depth sufficient to ensure that the foundation-bearing capacity is acceptable

10. The industry codes and standards to be implemented in executing the construction activities authorized by the LCA

11. Information on the electrical systems and components that will be installed as part of the LCA and that are designated as important-to-safety.

3.2.3 Evaluation

The reviewers evaluated the facility description in the Contractor's LCAR submittal and found that the Contractor met 9 of the 11 acceptance criteria. The remaining two criteria (items 5 and 11 above) pertained to information on duct banks for important-to-safety SSCs and electrical systems and components designated important-to-safety to be installed under the LCA. The Contractor stated in the LCAR that no important-to-safety duct banks or important-to-safety electrical systems and components will be installed under the LCA.

The evaluation of each of the 11 review criteria is discussed below:

1. The reviewers evaluated the description of the facility location and found it to be acceptable. In the LCAR submittal, the Contractor clearly identified the site location, the distance from the site boundary to the facility in all directions, and the distance to the nearest public receptor. The submitted site plot plan also showed the site dimensions. The information provided was considered adequate for subsequent calculations of potential impacts to the environment and to the public from eventual operation of the Contractor facilities. Location of the facility on this site was a requirement of the Contract and was not a part of the LCAR review.

2. The reviewers evaluated plot plans showing the location of the proposed buildings on the facility site and plant layout and found them to be acceptable. The submitted site plot plan identified the location of all major buildings, transportation right-of-ways, fence lines, and the prevailing wind direction on the site. The drawings also showed the proposed location of the underground electrical services, the fire protection system, waste transfer feed lines, and other utility transfer lines such as air, water, etc. Construction of important-to-safety SSCs is not included in the scope of the LCAR. The information

provided was sufficient for evaluation of site preparation and excavation activities included in the LCAR scope and therefore was acceptable. It should be noted that the location of the proposed buildings on the facility site and plant layout were reviewed only as they were relevant to site preparation and excavation activities. The evaluation of the facility buildings and plant layout with respect to hazard and accident analysis was not provided by the Contractor and was not a part of the OSR review of the LCAR.

3. The reviewers evaluated information on the footprints and elevations of the compacted subgrades for the proposed process buildings (pretreatment, HLW and LAW vitrification, and LAW pretreatment). The information provided included dimensions of mud mats, footprints, location of sheet pile, and excavation depths for the four process buildings. The reviewers found the information to be acceptable (see also item 9 below).

4. The LCAR provided a summary description of the hazard analysis results associated with potential fires in the facility. Control strategies developed to manage facility fire hazards rely on passive fire protection features (e.g., fire barriers and separation) provided in the facility design to reduce the risk from fires to acceptable levels. The Contractor stated in the LCAR that fire suppression water was not required to provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public and workers due to a radiological or chemical hazard. As such, the fire water main was not designated as important-to-safety. Accordingly, the excavation for the fire water main was not important-to-safety. The Contractor committed to comply with the requirements of National Fire Protection Association (NFPA) Standard No. 24, "Standard for the Installation of Private Fire Service Mains and Their Appurtenances," for designing and installing the fire water main. Compliance with NFPA 24 and SRD Safety Criterion 4.5-13 adequately ensure that appropriate quality will be applied to designing, constructing, installing, and testing the underground fire water main. The Contractor response was found to be acceptable.

   The reviewers assessed the fire water main portion of the LCAR submittal for SRD compliance. The codes and standards discussed in the LCAR were consistent with the SRD; however, applicable code and standard revisions/code of record dates were not identified. In response to OSR question 01-LCAR-023-Q, the Contractor stated that the codes of record for design and installation of the fire water main are NFPA Standard 801, "Standard for Fire Protection for Facilities Handling Radioactive Materials"; DOE-STD-1066, *Fire Protection Design Criteria*; DOE G-440.1, *Implementation Guide for Use with DOE Orders 420.1 and 440.1 Fire Safety Program*; and NFPA 24-1995. This response was found to be acceptable.

   The reviewers assessed the fire water main portion of the LCAR submittal for compliance with the SRD implementing codes and standards. Drawings supplied with the LCAR provided the planned location for post indicator valves and fire hydrants associated with the fire water main. However, the drawings did not show the separate shutoff valves for the fire hydrants required by NFPA 801, Section 4-4. In response to OSR question 01-LCAR-024-Q, the Contractor responded that it is committed to the requirements of NFPA 801and that the required isolation valves were included in the

design of the fire water main and in the design details as shown on preliminary project drawing DWG-24590BF-C00010. OSR reviewed the drawing and found it to be acceptable.

The reviewers assessed the fire water main design information provided with the LCAR for compliance with SRD implementing codes and standards. This review resulted in a multi-part question (01-LCAR-022-Q) concerning Contractor plans for submitting fire water system plans to the OSR (the Authority Having Jurisdiction [AHJ]), the basis for the 12-in. fire water main, the flow for the most demanding sprinkler system, the basis for the most demanding sprinkler system (0.2 gpm/ft^2 for 3000 ft^2), and the statement that "…sprinkler systems will be limited to ensure the capacity of the supply system is not exceeded."

The Contractor responded that the underground fire water piping drawings (system plans) would be provided for OSR (the AHJ) review before the fire water main is installed. However, as noted above, preliminary project drawing DWG-24590BF-C00010 was included with the responses to OSR questions on the LCAR. This drawing is the preliminary system plan for the scope of work associated with the LCAR. The preliminary drawing coupled with the Contractor's commitment to obtain OSR approval of the final fire water system plan before system installation was found to be acceptable.

The Contractor stated that the 12-in. polyvinyl chloride (PVC) fire water main was selected rather than 14-in. high-density polyethylene (HDPE) because it had a larger inner diameter and thus better hydraulic characteristics. This response was found to be acceptable.

The Contractor's response concerning the flow required for the most demanding sprinkler system was that this flow has not yet been determined for the project. However, based on the responses to the questions concerning the basis for the most demanding sprinkler system (0.2 gpm/ft^2 for 3000 ft^2) and what is meant by " …sprinkler systems will be limited to ensure the capacity of the supply system is not exceeded," the reviewers concluded that the lack of flow/design information was acceptable. The Contractor responded that sprinkler systems would be designed to extinguish ordinary hazard type fires, which are the highest anticipated fire hazard in the process buildings. The 0.2 gpm/ft^2 for 3000 ft^2 sprinkler fire water density criterion was established to support this fire hazard classification. The 12-in. PVC fire water main was sized to satisfy this sprinkler criterion and to provide a concurrent 500-gpm flow for hose streams. The OSR reviewed the requirements of NFPA 13, "Standard for the Installation of Sprinkler Systems," which the Contractor will use for designing the facility sprinkler systems. This capacity is adequate for the system. This response is therefore acceptable.

In response to the OSR question concerning the LCAR statement about limitations on sprinkler systems, the Contractor stated that the intent was to reflect that facility sprinkler system designs would be governed by the available pressure in the water supply. Subcontractors will design each system to operate within the design parameters and size the sprinkler piping accordingly. This response was found to be acceptable.

5. The reviewers evaluated information submitted on the duct banks. No important-to-safety duct banks will be installed during the limited construction phase. The portions of the duct banks that will be installed will expedite the construction schedule. Reviewers found this approach to be acceptable

6. The reviewers evaluated the Contractor's plan to construct the concrete batch plant. While no concrete will be poured for important-to-safety facilities during the limited construction phase, the Contractor stated that the subcontractor/owner of the concrete batch plant will be required to submit and follow an approved quality program. On completion of the batch plant, qualification to produce important-to-safety concrete will be conducted according to the Contractor's specifications and QAM requirements. The reviewers found this response to be acceptable.

7. The Contractor stated that material received and stored during the limited construction phase may include important-to-safety items. However, the Contractor committed in the LCAR that the materials will be received, controlled, and stored according to SRD Safety Criterion 7.3-5; the ISMP, Section 1.3.11; and the QA Manual, as applicable. The reviewers found this process to be acceptable.

8. The Contractor stated that all sampling, field testing, and laboratory testing will be performed by a civil material testing laboratory, located within the concrete operations area. The laboratory will be qualified per ASTM D3740, "Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction," which is included in Safety Criterion 4.1.2 of the SRD, to ensure the laboratory's capability to repeatedly and reliably perform tests to verify that important-to-safety attributes, such as soil density, compaction ratio, and soil moisture content, conform to design requirements. The reviewers found this approach to be acceptable.

9. The reviewers evaluated the excavation-related design for buildings containing important-to-safety SSCs and the Contractor's process for soil compaction, structural fill, and mud mat placement. The Contractor used the appropriate implementing codes and standards as specified in the SRD Safety Criterion 4.1-2 for the process. The selected standards are industry-accepted testing methods for determining soil properties in the laboratory and for field verification. The soil compaction process will be controlled through a quality-related specification that includes installation, inspection, and testing requirements to demonstrate that soils are compacted to meet the requirements specified for structural fill in the Contractor's Geotechnical Investigation Report, "Final Report, Geotechnical Investigation, River Protection project-Waste Treatment Plant, WTSC-1035-42-17." This report was submitted to and reviewed by the OSR in April 2000. The mud mat will be installed according to the structural fill and soil compaction specification with non-important-to-safety material for the mud mat. The acceptability of the mud mat material will be confirmed by testing to ensure that backfill requirements will be met. The submittal also stated that the Contractor's Geotechnical Investigation Report confirmed that the site soil could sustain significantly greater bearing loads than those estimated. This finding will be confirmed prior to submitting the construction authorization request by the Contractor's seismic design analysis. The reviewers found this response to be acceptable.

10. The reviewers evaluated the Contractor's listing of the consensus codes and standards to be used in executing the construction activities authorized by the LCA and found them to be acceptable. The codes and standards selected are consistent with the latest approved versions of the codes and standards used as implementing standards in the SRD and were acceptable to the reviewers.

11. The reviewers evaluated the information submitted on the electrical systems and components that would be installed as part of the limited construction activities and that were designated as important-to-safety and found the information to be acceptable. The Contractor indicated that no permanent power cables will be installed during limited construction. Only construction power will be provided. Cables will be routed in temporary concrete-encased duct banks, spare conduits in permanent non-important-to-safety duct banks, and overhead power distribution lines around the perimeter of the storage and laydown areas. The reviewers concluded that because no important-to-safety electrical systems or components will be installed during limited construction and because the installation of electricity supply for construction will not affect future important-to-safety systems or components, the Contractor's approach was acceptable.

3.2.4 Conclusions

The reviewers concluded that the Contractor met the requirements of the facility description portion of the LCAR. The submittal adequately described the facility to identify LCAR activities that could affect important-to-safety SSCs and any safety functions that depended on site preparation and excavation.

The Contractor's excavation-related design of buildings containing important-to-safety SSCs; the excavation process; and the process for soil compaction, structural fill, and mud mat placement, as described in the LCAR, are acceptable.

The reviewers concluded that the system performance requirements for the excavation associated with the fire water main do not require the excavation to be either important-to-safety or seismically qualified. The Contractor has committed to design, construct, install, and test the fire water main, including post indicator valves and fire hydrants, to the requirements of NFPA 24 and SRD Safety Criterion 4.5-13. The reviewers concluded that appropriate quality will be applied to the design, construction, installation, and testing the fire water main, post indicator valves, and fire hydrants.

3.3 Management Control Systems

Two important management control systems were evaluated for the limited construction activities: quality assurance and incident investigations.

3.3.1 Quality Assurance

This review was to determine whether the Contractor had implemented an acceptable QAM for

important-to-safety activities planned for limited construction.

3.3.1.1 Requirements

The QA requirements that apply during limited construction activities are found in the DOE/RL-96-0003. This document states, in part, the following:

> "The Contractor's QA plan is adequate and has been implemented such that the intended quality will be assured in the safety-related portions of the design, construction, and pre-operational testing and that the quality assurance records will attest thereto.
>
> This submittal package shall consist of the following documentation: 14) Description of QA program, including implementation procedures, employed during the design, and to be employed during construction, safety-related testing, and pre-operational testing."

The QA requirements are also addressed in DOE/RL-96-0006, *Top-Level Radiological, Nuclear, and Process Safety Standards and Principles for the RPP Waste Treatment Plant Contractor*,[14] which states, in part, the following:

> "QA and Quality Control (QC) should be applied throughout all phases and to all activities associated with the facility as part of a comprehensive system to ensure with high confidence that all items delivered and services and tasks performed meet required standards.
>
> The Contractor should use well proven and established techniques and procedures supported by quality assurance practices to provide high quality equipment and achieve high quality construction."

The Contractor's SRD contains specific regulatory and contractual requirements for QA in Chapter 1.0, "Radiological, Nuclear and Process Safety Objectives," and Section 7.3, "QA Program."

In the Contract, the RPP-WTP Contractor is required to do the following:

> "...develop a QA Program, supported by documentation that describes overall implementation of QA requirements. Documentation shall identify the procedures, instructions, and manuals used to implement the Contractor's QA program within the Contractor's scope of work. The Contractor's documentation shall be submitted to DOE for review and approval."

[14] DOE/RL-96-0006, *Top-Level Radiological, Nuclear, and Process Safety Standards and Principles for the RPP Waste Treatment Plant Contractor*, Section 4.1.6, "Quality Assurance.

The Contract further requires that the Contractor use a technically defensible graded approach to develop the QA Program (documented as a QAM) based on the following requirement:

> "QA for radiological, nuclear, and process safety shall be conducted in accordance with 10 CFR 830.120."[15]

3.3.1.2 Review Methodology

The Contractor's commitment to an approved QAM for limited construction was evaluated. The OSR developed a specific document to provide guidance on the content of the Contractor's QAM that would satisfy the regulatory requirements in RL/REG-96-01, *Guidance for Review of the RPP-WTP Contractor Quality Assurance Program*. Accordingly, this review guidance was used during the review of the QAM. The OSR augmented the review guidance with RL/REG-2000-14, *Quality Assurance Program Planning Handbook*, which provides a specific process for conducting the review and describing expectations of the reviewers.

3.3.1.3 Evaluation

The OSR review of the Contractor's QAM is documented separately in ORP/OSR-2001-10, *Office Of Safety Regulation Evaluation of the River Protection Project Waste Treatment Plant Contractor's Quality Assurance Manual*. The reviewers determined that the QAM was adequate for construction.

In addition, the OSR reviewed the LCAR for consistency with the QAM. The reviewers observed that the LCAR used the terms "QA Manual" and "QA Program" in a way that was inconsistent with the QAM. Therefore, question 01-LCAR-012-Q was submitted relative to the definition of "QA Program." The Contractor responded that, "The term QA Program will be changed to QA Manual for consistency…with other project documents." The reviewers found the response to be acceptable.

The reviewers also determined that the process for grading the application of QA described in the LCAR was different than that described in the QAM. The reviewers asked the Contractor to clarify what grading process would be applied (01-LCAR-013-Q). The Contractor responded that the process described in the QAM would be used. The QAM review determined that this process was acceptable; therefore, the reviewers concluded that the response was adequate.

The reviewers noted that the LCAR required that nonconforming items that are reworked, repaired, or replaced be "…inspected, tested, or reviewed in accordance with original requirements, or approved alternate requirements, respectively." The reviewers noted that the QAM did not require approval of alternate requirements and asked the Contractor to clarify what approval process would be used (01-LCAR-014-Q). The Contractor responded that the

[15] This Code of Federal Regulation (CFR) was revised and is now referenced as Subpart A of 10 CFR Part 830. Although the current BNI Contract does not call out the revised CFR, it is federal law that the Contractor is required to meet. Therefore, this evaluation was conducted against the requirements of the revised CFR.

terminology would be changed to make the LCAR consistent with the QAM. The reviewers found the response to be acceptable.

The reviewers found that the LCAR did not require that important-to-safety activities performed by subcontractors who work to the WTP QA Program be subject to audit, surveillance, and document review. Rather, only monitoring and inspection were required. The QAM did not describe any difference in the oversight provided for subcontractors working to their own QA programs and those working to the Contractor's QA Program. Therefore, the reviewers asked the Contractor to explain this difference (01-LCAR-016-Q). The Contractor responded that, "Subcontractors [working to the WTP QA Program] will be subject to 'audit, surveillance, document review, as appropriate.'" The reviewers found that, while the Contractor did not commit to change the language of the LCAR, its response is consistent with the QAM and was therefore acceptable.

Based on the Contractor's responses to the questions noted above, the reviewers determined that the LCAR and the QAM were consistent.

The reviewers noted that the LCAR described the use of a materials testing laboratory. While the laboratory was not an important-to-safety SSC, it will be used to perform important-to-safety testing of soils during limited construction. The reviewers asked (01-LCAR-015-Q) the Contractor to clarify "to what extent the materials testing laboratory service would: (a) be evaluated and qualified by BNI before use and (b) be required to submit and follow an approved quality program?" The Contractor responded that, "The materials testing laboratory subcontractor is required to provide a Quality Assurance Plan. …BNI QA will review this program and monitor implementation of the vendor's plan." The reviewers determined that this commitment was consistent with the requirements of the QAM and adequately addressed the question.

3.3.1.4 Conclusions

The reviewers concluded that the Contractor's QA Program was adequate for limited construction. If implemented as described in the LCAR and the QAM, the intended quality will be ensured in the portions of limited construction related to important-to-safety SSCs.

3.3.2 Incident Investigations

The purpose of this review was to determine whether the Contractor had a program to address incident reporting and investigation to respond incidents that may arise during limited construction activities.

3.3.2.1 Requirements

The oversight process established in DOE/RL-96-0003 describes Contractor information submittals and OSR actions related to incident reporting and investigation.[16] The Contractor's submittal should describe the standard and implementing program that will be in place to fulfill these oversight requirements during limited construction.

The Contract establishes specific deliverables related to incident reporting and investigation. Section C, Standard 7, Table S7-1, of the Contract requires a final Construction Occurrence Reporting Plan in connection with construction authorization regulatory actions. Section C, Standard 1 of the Contract specifies an Occurrence Reporting deliverable[17] and specifies that occurrence reporting will adhere to DOE M232.1-1A, *Occurrence Reporting and Processing of Operations Information*.[18] Accordingly, the Contractor's submittal should address the Construction Occurrence Reporting Plan regulatory deliverable requirement. In addition, to the extent that DOE M 232.1-1A is applicable to limited construction activities, the event reporting aspects of the Contractor's incident reporting and investigation program should conform to DOE M 232.1-1A.

Consistent with DOE nuclear safety requirement enforcement policy (10 CFR 820, Appendix A, "General Statement of Enforcement Policy), the oversight process established in DOE/RL-96-0003 specifies that noncompliance with DOE nuclear safety requirements will be communicated to the DOE Office of Price-Anderson Enforcement.[19] Contractor responsibilities, ORP responsibilities, and reporting mechanisms related to noncompliance reporting are described in RL/REG-98-06, *Corrective Action Program Description*,[20] which is referenced in Section C, Standard 7, of the Contract. The Contractor's incident reporting and investigation standard and implementing program should address reporting of noncompliances with DOE nuclear safety requirements to the ORP Price-Anderson Amendments Act Coordinator and the DOE Office of Price-Anderson Enforcement.

Aspects of the incident reporting and investigation standard and implementing program that address identifying, tracking, and implementing corrective actions taken in response to incidents should be consistent with the relevant requirements of Subpart A of 10 CFR 830 and the Contractor's QAM.

Additional relevant requirements are included in the SRD, Section 7.7, "Reporting and Incident Investigation," specifically SRD Safety Criteria 7.7-1 through 7.7-9. The description of the Contractor's incident reporting and investigation standard and implementing program should reflect implementation of the SRD criteria in a manner appropriately tailored to the limited construction phase.

[16] DOE/RL-96-0003, Section 3.3.5, Item 6; Section 4.5.1, Item 2; Section 4.5.2, Item 4; and Section 4.5.3, Item 6.
[17] Contract No. DE-AC27-01RV14136, Table C.5-1.1, Deliverable 1.8.
[18] DOE M232.1-1A, *Occurrence Reporting and Processing of Operations Information*, Section C, Standard 1, Paragraph (f)(3). DOE M232.1-1A is also cited in Section J, Attachment E, Table (b).
[19] RL/REG-98-06, *Corrective Action Program Description*, Section 3.3.5, Item 14.
[20] RL/REG-98-06, *Corrective Action Program Description*, Section 7.5, Implementation of 10 CFR 820 Procedures.

3.3.2.2 Review Methodology

The reviewers evaluated the Contractor's description of its incident investigation process provided in Section 5, "Notification, Categorization and Consequence Assessment," of the LCAR submittal. The submittal was reviewed to verify that the program addressed discovery of programmatic safety issues as well as important-to-safety events. Programmatic safety issues include the discovery of repetitive failures to meet regulatory expectations, and misrepresentations associated with information that is important-to-safety.

The reviewers also verified that the Contractor's Construction Occurrence Reporting Plan (or the portions applicable to limited construction) addressed the following elements in a manner consistent with the incident reporting and investigation standard:

1. Types of incidents to be addressed under the program for limited construction

2. Criteria for reporting incidents (i.e., reporting thresholds) and methodology to notify appropriate regulatory authorities

3. Timeliness criteria for reporting incidents

4. How incident reports are initiated, reviewed, and approved

5. How incidents are investigated

6. How incident causes are determined and appropriate corrective actions are identified, tracked, and implemented

7. Contractor responsibility assignments with regard to incident reporting and investigation.

3.3.2.3 Evaluation

The reviewers evaluated the Contractor's description of the incident investigation process in the LCAR. The LCAR section referenced several SRD Safety Criteria, DOE Manual 232.1-1A, and several ISMP requirements. In some cases the referenced material was followed by a brief description of its applicability. These references provided a description of general requirements relevant to incident reporting and investigation for limited construction. However, the reviewers found that the material provided in Section 5 of the LCAR did not describe how these requirements interrelated and how these requirements formulated the elements of a Construction Occurrence Reporting Plan as discussed in Section 3.2.4 of the LCAR Review Guidance. This was communicated to the Contractor in a series of questions submitted to the Contractor (01-LCAR-001Q) on June 19, 2001. In a letter dated July 3, 2001,[21] BNI provided additional information on the seven elements of a Construction Occurrence Reporting Plan discussed in Section 3.3.2.2 above. The response provided by the Contractor was determined to be inadequate for the following reasons:

[21] CCN: 021158, BNI letter, A. Veirup to M. Barrett, ORP, "Response to U.S. Department of Energy, Office of Safety Regulation's Quesitons on the Limited Construction Authorization Request," dated July 3, 2001.

- There was no commitment to make reports to the OSR as required by DOE/RL-96-0003, Paragraph 4.5.2, item 4.

- The proposed standard did not adequately ensure that subcontractors report construction occurrences in accordance with the Construction Occurrence Reporting Plan.

- Information provided in the response was based on DOE M 232.1-1A. However, the information was not appropriately tailored to the limited construction phase activities. In addition, the response was inconsistent with the Safety Requirements Document requirements and terminology, and did not refer correctly to the ORP and BNI organizations.

This information was communicated to the Contractor in a letter dated July 23, 2001.[22]

The Contractor addressed the above concerns in a letter dated July 26, 2001[23] which submitted a Construction Occurrence Reporting Plan for Limited Construction. The reviewers evaluated the plan and found that the plan;

- Contained the information outlined in Section 3.3.2.2 above

- Was consistent with DOE M 232.1-1A, "Occurrence Reporting and Processing of Operations Information," tailored for limited construction activities

- Was consistent with SRD Safety Criteria 7.7-4, 7.7-5, 7.7-6, and 7.7-7 relative to "Unusual Occurrences" and "Off-Normal Occurrences" as applicable for limited construction activities

- If properly implemented, will meet the requirements of DOE/RL-96-0003 to report occurrences to the OSR

- Fulfills the deliverable required by the Contract, Section C, Standard 7, Table S7-1, for limited construction.

3.3.2.4 Conclusions

The Contractor's Construction Occurrence Reporting Plan for Limited Construction was reviewed against the acceptance criteria in RL/REG-99-17, Section 3.2.3.2, and found to be acceptable. The reviewers concluded that the Contractor has committed to an acceptable incident reporting and investigation program that provides the following:

[22] 01-OSR-0282, ORP Letter, R. Barr to R. Nevanti, BNI, "Office of Safety Regulation (OSR) Request for additional clarification to limited construction authorization request (LCAR) question 01-LCAR-020Q," dated July 23, 2001.
[23] CCN 021691, BNI Letter A. Veirup to M. Barrett, ORP, "Supplement to response to U. S. Department of Energy, Office of Safety Regulation Question 01-LCAR-001 on Limited Construction Authorization Request," dated July 26, 2001.

1. Descriptions of types of incidents to be addressed under the program for limited construction.

2. Criteria for reporting incidents (i.e., reporting thresholds) and methodology to notify appropriate regulatory authorities.

3. Commitments to timeliness criteria for reporting incidents.

4. Descriptions of how incident reports will be initiated, reviewed, and approved.

5. Descriptions of how incidents will be investigated.

6. Descriptions of how incident causes will be determined and how appropriate corrective actions will be identified, tracked, and implemented.

7. Descriptions of its responsibility assignments with regard to incident reporting and investigation.

3.4 Environmental Radiological Protection

The purpose of this review was to determine if the Contractor had implemented acceptable environmental protection measures to protect the public and the environment from unplanned releases of radioactive material during limited construction activities. Although routine releases to the environment are not anticipated during these activities, the potential exists for inadvertent releases if soil contamination or buried wastes are encountered during excavation.

3.4.1 Requirements

The requirements for environmental protection for Construction Authorization are found in the Regulatory Process document,[24] which states that the CAR submittal shall include the "drafts of the Environmental Radiological Protection Program." Because much of the Environmental Radiological Protection Program (ERPP) is not applicable to limited construction activities, it is not necessary for a draft ERPP to be developed for these activities. However, the Contractor's submittal must address those elements of the environmental radiological program that are relevant to limited construction.

Selected environmental protection safety criteria from the SRD were identified to be potentially relevant to the planned limited construction activities. In addition to some of the components of Safety Criterion 5.3-1 (environmental radiological protection), these were Safety Criteria 2.0-1 (radiological dose standards); Safety Criterion 5.4-2 (monitoring of fugitive emissions); Safety Criteria 5.4-3 and 5.4-6 (dose determination); Safety Criteria 5.4-7 and 5.4-8 (demonstration of compliance with limits); Safety Criterion 5.4-9 (maintenance of records); and Safety Criterion 5.4-10 (implementation of an environmental surveillance program). These criteria may apply if

[24] *DOE Process for Radiological, Nuclear, and Process Safety Regulation of the RPP-WTP Contractor*, DOE/RL-96-0003, Rev. 1, Section 4.3.2, "Contractor Input," Item 18g, July 1998.

radioactive contamination is encountered unexpectedly during limited construction activities.

3.4.2 Review Methodology

The reviewers evaluated the Contractor's submittal for those elements of environmental radiological protection safety criteria that were relevant to the planned limited construction activities. The management controls specified for these activities were also reviewed. The following relevant environmental protection components, contained in the approved Radiological Protection Program, were reviewed:

1. The commitment to conforming to dose limits during limited construction

2. The approach to controlling residual radioactive contamination should it be encountered during limited construction

3. The documentation related to the relevant items of the ERPP for limited construction

4. The approach to taking environmental samples and surveys during limited construction

5. The approach for monitoring, recording and reporting compliance with the ERPP during limited construction.

3.4.3 Evaluation

Supporting the limited construction activities, the Contractor has an approved Radiological Protection Program that provides: 1) the commitment to conformance with dose limits during limited construction, 2) control of any residual radioactive contamination that may be encountered through the establishment of action levels that will trigger mitigative actions if radioactive contamination above background levels are encountered, 3) documentation of the relevant items through the approved Radological Protection Program (including controls on the release of materials and property containing residual radioactive contamination), 4) the use of environmental samples and radiation surveys to limit and control the spread of radioactive contamination, if encountered, and 5) methods to collect, document, store, and retain all contamination and exposure records, as required by the Radiological Protection Program. Further, the Contractor has addressed and documented in the LCAR, as related to limited construction activities, their commitment to: the appropriate components of Safety Criterion 5.3-1; Safety Criteria 2.0-1; Safety Criterion 5.4-2; Safety Criteria 5.4-3 and 5.4-6; Safety Criteria 5.4-7 and 5.4-8; Safety Criterion 5.4-9; and Safety Criterion 5.4-10. Finally, the Contractor has prepared two Notice of Construction (NOC) applications to the Washington State Department of Health (WDOH) supporting excavation activities, and is obtaining a radioactive emission license as a precautionary measure should radioactive contamination be encountered during soil excavation.

3.4.4 Conclusions

The environmental radiological protection provisions, contained in the approved Radiological Protection Program, were reviewed against the criteria defined in Section 3.4.1 above and found to be acceptable. The review concluded the Contractor had provided adequate environmental radiological protection measures relevant to limited construction activities.

3.5 Contractor's Technical and Experience Qualifications to Conduct Limited Construction

The purpose of this review was to determine if the personnel performing limited construction activities are adequately qualified and trained to perform their assigned work.

3.5.1 Requirements

The requirements for technical and experience qualifications are found in DOE/RL-96-0003, which stated that, before authorization for construction, the Contractor shall demonstrate that it "is qualified by reason of experience and training to perform the proposed construction." This requirement was interpreted to also apply to limited construction.

3.5.2 Review Methodology

The reviewers evaluated the Contractor's submittal to ensure that personnel performing limited construction activities had the knowledge and skills necessary to perform the work in a manner that adequately protected the health and safety of the facility and co-located workers, the public, and the environment.

The reviewers assessed the experience and qualifications of the Contractor in the following areas as an indication of its demonstrated experience for limited construction: Safety Criteria 5.0-1 (radiation protection), 5.3-1 (environmental radiological protection), 7.3-1 (QA), and 7.7-1 (reporting and incident investigation).

3.5.3 Evaluation

The Contractor's technical qualifications, described in Section 7 of the LCAR, reasonably ensure that personnel performing limited construction activities will be capable of performing the work assigned based on the implemented Contractor training and qualification programs and special experience, training, or qualifications. Prior to the LCAR review, from May 14-18, 2001, the OSR inspected the Contractor's personnel training and qualification programs. The inspectors concluded that the Contractor's training and qualification programs complied with the requirements of the QA Program and with the commitments both in the ISMP and in other parts of the authorization basis. The inspectors observed that the training and qualification programs were implemented adequately and were effective in providing appropriately qualified and certified staff to accomplish the important-to-safety work described in the authorization basis.

Details of the inspection were documented in Inspection Report IR-01-001, "Training and Qualification Inspection."

In LCAR Section 7.2, the Contractor affirmed "Personnel will be trained and qualified to ensure they are capable of performing their assigned work and provided with continuing training to ensure job proficiency is maintained in accordance with ISMP Section 1.3.12 and SRD Safety Criterion 7.3-3." In LCAR Section 3.4.1, in the paragraphs under, "Construction Training," the Contractor committed to meet special experience, training, and qualification needs for limited construction by (1) using qualified journeymen, (2) completing special training and qualification for selected activities, such as welding, and (3) using qualified field engineering personnel and certified quality control personnel.

The Contractor described experience qualifications for performing limited construction work activities to ensure that the activities can be performed effectively and safely. In LCAR Section 7 in conjunction with information provided in response to OSR question 01-LCAR-027-Q, the Contractor demonstrated that it had the experience and qualifications to perform limited construction activities safely. The Contractor described its demonstrated experience in designing and constructing large and complex projects to quality standards in regulated environments in the following areas:

- Radiation protection (Safety Criterion 5.0-1)
- Environmental radiological protection (Safety Criterion 5.3-1)
- QA (Safety Criterion 7.3-1).

3.5.4 Conclusions

The technical and experience qualifications were found to be acceptable. The reviewers concluded that the Contractor adequately described its technical and experience qualifications and that the personnel performing limited construction activities are capable of performing their assigned work.

3.6 Radiation Protection Program

The purpose of this review was to determine if the Contractor's submittal adequately referenced and committed to an approved Radiation Protection Program to ensure the radiological health and safety of the facility and co-located workers during the limited construction activities, as required by 10 CFR 835. The area of radiation safety was addressed in the LCAR because of the potential for encountering radioactive contamination and/or radiation (such as radiography sources) during limited construction activities. Although routine releases causing radiation exposure to the facility and co-located workers and the public were not anticipated during these activities, the potential exists for accidental releases of radioactive material if soil contamination or buried wastes were encountered unexpectedly during excavation. In addition, radioactive contamination may occur at the construction site because of transient radioactive contamination, such as that found in tumbleweeds and animal waste. The Contractor's Radiation Protection

Program for limited construction activities was expected to address such situations to provide the appropriate level of radiation safety, as required by 10 CFR 835.

3.6.1 Requirements

The requirements for the Radiation Protection Program are found in the Contract, which requires the Contractor to submit a revised Radiation Protection Program for construction authorization. Because this covers all phases of construction, limited construction activities were included. Further, 10 CFR 835.101, "Radiation Protection Program," requires that a revised Radiation Protection Program be submitted to DOE if the Contractor planned new work activities that were not covered by a current approved Radiation Protection Program. Limited construction site preparation activities, such as clearing or leveling, were not covered under the Radiation Protection Program approved for design. Therefore, a revised Radiation Protection Program submittal was required before limited construction activities could be started.

3.6.2 Review Methodology

A revised Radiation Protection Program for Design and Construction, Revision 5A, was reviewed independently of the LCAR by a separate OSR review team using the Radiation Protection Program review guidance, RL/REG-98-11, *Guidance for Review of the RPP Waste Treatment Plant Contractor Radiation Protection Program Document Required by 10 CFR 835, Occupational Radiation* Protection.

3.6.3 Evaluation

The Contractor submitted the Radiation Protection Program for Design and Construction, Revision 5A, to the OSR on November 28, 2000. The OSR Radiation Protection Program review team evaluated the Radiation Protection Program using the methodology described above. The evaluation focused on determining if the content of the Radiation Protection Program was commensurate with the nature of activities being planned, the expected use of radioactive material and/or radiation producing devices during construction, and the potential for radioactive material or radiation on the construction site resulting from co-located facilities or residual contamination. The reviewers also verified that the Radiation Protection Program included plans, schedules, and measures to ensure that occupational radiation protection requirements presented in 10 CFR 835 would be met and to ensure any radiation exposures would be maintained as low as reasonably achievable.

The OSR issued an SER for the Radiation Protection Program, Rev. 5A, on April 20, 2001[25]. The SER cover letter approving the Radiation Protection Program stated in part that approval was "contingent upon the Contractor revising the Radiation Protection Program in accordance with its responses…to questions raised by the OSR in its review." Radiation Protection Program, Revision 7, was issued on June 7, 2001. This revision included the Contractor's

[25] 01-OSR-0123, ORP Letter R. Barr to R. Naventi, BNI, "Office of Safety Regulation Approval of the Bechtel National, Inc. Radiation Protection Program (RPP) for Design and Construction, Revision 5A," dated April 20, 2001.

responses to the OSR's questions and provided reasonable assurance that the Contractor would complete development and implementation of an adequate radiation protection program prior to the start of limited construction.

On June 27, 2001, the Contractor submitted a revised Radiation Protection Program, Revision 8, to the OSR to cover WTP construction activities that may be performed on the Hanford site at locations other than the RPP-WTP site. This change did not reduce the effectiveness of the Radiation Protection Program because the construction activities will be performed under the same constraints identified in Revision 7 of the Radiological Protection Program. On July 19, 2001, DOE approved Revision 8 of the Radiation Protection Program.[26]

The OSR approved an Authorization Basis Change Notice revising the SRD and ISMP to be consistent with the approved Radiation Protection Program.[27]

The reviewers generated four questions that related to radiological protection activities. The reviewers requested clarification (01-LCAR-019-Q) of the status of the Contractor's Radiological Control Program (RCP) because one part of the LCAR text indicated there would be an RCP, while another part of the LCAR stated the RCP had been cancelled. The Contractor's response clarified that there would be an RCP as described in SRD Safety Criterion 5.0-1; the OSR found this response acceptable.

The reviewers requested clarification (01-LCAR-020-Q) of details concerning the frequency of radiological surveys and sampling because the LCAR stated the Contractor did not intend to perform additional site characterization. The Contractor stated that after an initial survey, periodic confirmatory surveys would be performed and that the survey would concentrate in areas where there is a high probability of contamination (e.g., the site boundary facing the Tank Farms). The target frequency would be quarterly. The quarterly frequency would be augmented by surveys after sustained high winds (i.e., those that transport dead vegetation) and extensive excavation (i.e., excavation depths of 15 - 20 feet). Also, the survey periodicity would be more frequent at the beginning of LCA (e.g., daily) during significant excavation until sufficient data could be accumulated to substantiate a reduced frequency of survey. In addition, the Contractor stated that as part of the survey process, minor contamination (i.e., that which could be remediated by a radiological control technician [RCT] within an eight hour period) would be remediated by the Contractor and the material collected, packaged, and stored for DOE disposition. Major remediation was clarified to include that which would take an RCT more than eight hours to cleanup and include items such as drums, equipment, and materials. The reviewers found the Contractor's responses acceptable.

The reviewers requested clarification (01-LCAR-021-Q) of the LCAR statement that radioactive materials will not be required to perform limited construction because of potential use of radiographic sources. The Contractor stated that industrial radioactive sources (e.g.,

[26] 01-OSR-0265, ORP Letter from R. Barr to R. Naventi, BNI, "Office of Safety Regulation (OSR) Response to Bechtel National, Inc. (BNI) Letter Authorization Basis Change Notice ABCN-24590-01-00003, 'RPP-Revised Applicability to Include All Activities Performed on the Hanford Site'," dated July 19, 2001.
[27] 01-OSR-0300, ORP Letter from R. Barr, OSR, to R. Naventi, BNI, "Office of Safety Regulation Approval of Bechtel National, Inc. Authorization Basis Change Notice ABCN-24590-01-00005, SRD and ISMP Changes Supporting Implementation of the RPP for Design and Construction," dated August 9, 2001.

radiographic sources and soil density gages) may be used during limited construction. The reviewers found the response acceptable.

The reviewers requested clarification (01-LCAR-029-Q) regarding how the WTP site fencing, and its location, will be integrated into the design criteria to distinguish between the worker and the co-located worker for evaluation of SRD SC 2.0-1 Radiological Dose Standards. The Contractor stated that administrative controls would be established to ensure that individuals outside of the controlled area fence, and within 100 meters of the HLW and PT buildings, would be evacuated in a timely manner in the event of an accident (either at HLW or PT) thereby reducing their exposure even further. Other emission source locations on the site (such as the LAW vitrification facility) would have the fence at 100 meters or greater. The reviewers found the responses to be acceptable.

3.6.4 Conclusions

The Contract requires that prior to construction, a Radiation Protection Program revision be submitted for DOE approval. DOE has reviewed and approved Radiation Protection Program, Revision 8, that provides reasonable assurance that the radiation hazards associated with construction on the Hanford Site will be controlled in accordance with the requirements in 10 CFR 835 and the dose to workers will be maintained as low as reasonably achievable. In addition, the radiation protection measures specified by the Contractor's responses to the OSR's LCAR questions provide adequate assurance that suitable radiological control program measures will be in place to protect the worker, the co-located worker, and the public.

3.7 Approach to Implement the Construction and Preoperational Portions of the SRD and ISMP

This review was to determine whether the Contractor's submittal adequately described the procedures for implementing portions of the SRD and the ISMP applicable to limited construction activities.

3.7.1 Requirements

The requirements for the Contractor's approach to implement construction are found in DOE/RL-96-0003, which states that authorization for construction will not be issued unless the OSR determines that "the Contractor's construction and preoperational testing procedures are adequate to ensure that the construction-related part of the SRD will be properly implemented." The document further states that the Contractor must define "the approach to be used to implement the construction and pre-operational testing portions of the SRD and the ISMP." These requirements are applicable to work activities associated with limited construction activities.

The SRD contained several safety criteria that addressed limited construction activities. These included, but were not limited to, Safety Criteria 4.0-1 and 4.0-2 (configuration management), 5.0-1 and 5.3-1 (radiation protection programs), 7.3-1 through 7.3-12 (QA), and 7.7-1 through 7.7-9 (incident investigations and reporting). Before or concurrent with its submittal, the

Contractor was expected to clarify which portions of the SRD pertain to limited construction activities.

The Contractor's ISMP contained many commitments that potentially pertain to limited construction activities, such as the following:

- Sections 1.3.11, 1.3.12, 1.3.13, 1.3.16, and 1.3.17, which described relevant elements of the Contractor's safety approach
- Section 2.0, which discussed regulatory compliance
- Sections 3.3 and 3.5, which discussed conformance to relevant top-level safety standards and principles
- Sections 3.15, 3.16.1, 3.16.3, and 3.16.5, which discussed training and internal safety oversight
- Section 4.0, which discussed standards based management processes
- Section 5.6.7, which discussed incident investigations
- Chapter 6.0, which discussed ISM
- Chapter 8.0, which discussed document control
- Section 9.1, which discussed scheduling, including LCA work activities
- Chapter 10.0, which discussed assessments.

In addition to these chapters and sections, Section 11.1 of the ISMP defined the safety roles and responsibilities applicable to the construction phase (which includes limited construction) for individuals within the Contractor's organization. As with the SRD, the Contractor was expected to clarify which sections of the ISMP apply to limited construction.

3.7.2 Review Methodology

The reviewers evaluated the submittal to determine whether the Contractor accurately described the commitments associated with limited construction activities in the SRD and the ISMP. This included reviewing the portions of both the SRD and ISMP that pertained to limited construction activities and evaluating whether the Contractor's relevant safety criteria and ISM approaches were evident in the procedures listed in the submittal for the facility's limited construction work activities. Since the potential existed for the Contractor to encounter radiological contamination during limited construction, the submittal evaluated the procedures and practices proposed to respond to such contamination if it occurs.

3.7.3 Evaluation

The Contractor identified in its submittal which portions of the SRD and ISMP pertain to limited construction activities by citing those portions in the sections of the LCAR describing the specific activities. For example, the LCAR, Section 3, "Management Control Systems," cites SRD Safety Criteria 1.0-10, 4.0-1, 4.0-2; all of Section 7.3; and the ISMP, Sections 1.3.13, 1.3.16, and 5.3 as requirements for management control systems needed for limited construction.

In the LCAR Section 8, the Contractor described its approach to ensure that the relevant portions of the SRD and ISMP are implemented. The Contractor committed in its approach to the following:

1. Identify the limited construction activities, including those that may impact important-to-safety SSCs. This element of the approach was documented in Table 1, "WTP Project Limited Construction Activities," of the LCAR.

2. Identify the radiological, nuclear, and process regulatory commitments from the SRD and ISMP that apply to the activities identified in step 1. As stated above, the LCAR cites ISMP and SRD requirements that are specific to limited construction activities. Also, those SRD and ISMP requirements applicable to other project activities that are not cited in the LCAR are not excluded during limited construction.

3. Identify and develop procedures that will implement the regulatory commitments from the SRD and ISMP identified in Step 2.

4. Assess that the plan for performance of limited construction activities complies with the SRD and ISMP by performing a project self-assessment prior to the start of activities to ensure acceptability and compliance of the activities with the SRD and ISMP.

The Contractor's approach is consistent with the program described in the ISMP for ensuring that the relevant SRD safety criteria are implemented. In addition to the approach described above, the LCAR cited the ISMP, Sections 1.3.11, 1.3.12, 1.3.13, 1.3.16, and 1.3.17, which described relevant elements of the Contractor's safety approach.

3.7.4 Conclusions

The approach for implementing the limited construction portions of the SRD and ISMP was found to be acceptable. The reviewers concluded that the Contractor adequately described its approach for successfully implementing the limited construction portions of the SRD and the ISMP. This approach relies on established policies and procedures.

The OSR will conduct an LCA Readiness Inspection, presently scheduled for August 2001, during which specific examples of safety criteria from the SRD will be assessed to confirm that the Contractor has developed procedures to implement the provisions of the SRD and ISMP.

3.8 SRD and ISMP Acceptability and Compliance

The purpose of this review was to determine whether the Contractor's proposed limited construction activities complied with the SRD and the ISMP. Compliance was determined by reviewing all LCAR submittal sections to determine whether they complied with the approved SRD and ISMP. A final determination of the Contractor's proposed limited construction activities compliance with the SRD and the ISMP will be made in conjunction with the LCA Readiness Inspection, scheduled for August 2001.

3.8.1 Requirements

The requirements for the Contractor's compliance to the SRD and ISMP are found in DOE/RL-96-0003, which states that a construction authorization would be issued on determination by the SRO that "the Contractor's important-to-safety activities are being conducted in accordance with its approved ISMP" and the Contractor's limited construction activities comply with the limited construction-related part of the updated SRD. These requirements apply to the extent that the requirements deal with limited construction activities.

3.8.2 Review Methodology

The reviewers evaluated the submittal to determine whether the Contractor's proposed limited construction activities complied with the SRD and ISMP. Compliance was determined by reviewing all LCAR submittal sections to determine whether they complied with the approved SRD and ISMP. The relationship between the ISMP sections and the corresponding LCAR review guidance sections is shown in Table 2. A final compliance determination of whether the Contractor's quality-related activities are being conducted according to its approved ISMP will be made in conjunction with the LCA Readiness Inspection, scheduled for August 2001.

In addition, the reviewers determined whether the Contractor had provided a comprehensive and adequate assessment of compliance to the SRD and ISMP (Section 4.3.2, "Contractor Input").

Table 2. ISMP Sections Relating to LCAR Guidance Sections

ISMP Section and Title	LCAR Guidance Section and Title
1.3.11, "Quality Levels"	3.1, "Quality Assurance"
1.3.12, "Training"	3.1, "Quality Assurance;" 5.0, "Contractor's Technical and Experience Qualifications to Conduct Limited Construction"
1.3.13, "Procedures"	3.1, "Quality Assurance"
1.3.16, "Configuration Management"	3.1, "Quality Assurance"
1.3.17, "Incident Investigations"	3.2,, "Incident Investigations"
2.0, "Compliance with Laws and Regulations"	G., "SRD and ISMP Acceptability and Compliance"
3.3, "Authorization Basis"	F., "Approach to Implement the Limited Construction Portions of the SRD and the ISMP;" G., "SRD and ISMP Acceptability and Compliance"
3.5, "Quality Assurance Program"	3.1, "Quality Assurance"

ISMP Section and Title	LCAR Guidance Section and Title
3.15, "Training and Qualification"	3.1, "Quality Assurance;" 5.0, "Contractor's Technical and Experience Qualifications to Conduct Limited Construction"
3.16.1, "Safety Committees"	3.1, "Quality Assurance"
3.16.3, "Incident Investigation"	3.2, "Incident Investigations"
3.16.5, "Performance Monitoring"	3.2, "Incident Investigations"
4.0, "Standards Based Management"	F., "Approach to Implement the Limited Construction Portions of the SRD and the ISMP"
5.6.7, "Investigation of Incidents"	3.2, "Incident Investigations"
6.0, "Integrated Safety Management"	E., "Limited Construction Approval Request Detailed Review"
8.0, "Document Control and Maintenance"	3.1, "Quality Assurance"
9.1, "Scheduling Safety Related Activities"	C., "LCAR Review Approach"
10.0, "Assessments"	3.1, "Quality Assurance"
11.1, "Design, Construction, and Commissioning Contractor Organization Roles, Responsibilities, and Authorities"	D., "LCAR Submittal Requirements"

3.8.3 Evaluation

The evaluation was performed by reviewing all LCAR submittal sections to determine whether they complied with the approved SRD and ISMP. This included evaluation of SRD Sections 1.0, 7.3, and 7.7; SRD Safety Criteria 1.0-9, 1.0-10, 2.0-1, 4.0-1, 4.0-2, 4.1-2 through 4.1-14, 4.5-13, 5.0-1, 5.3-1, 5.4-2, 5.4-3, 5.4-6 through 5.4-10, 7.0-4, 7.3-1, 7.3-3 through 7.3-12, and 7.7-1 through 7.7-9; and the ISMP, Sections 1.3.11, 1.3.12, 1.3.13, 1.3.16, 1.3.17, 2.0, 3.3, 3.5, 3.15, 3.16.1, 3.16.3, 3.16.5, 4.0, 5.6.7, 6.0, 8.0, 9.1, 10.0, and 11.1.

The Contractor identified the limited construction activities that may impact important-to-safety SSCs. These were limited to activity numbers 0001 (Site Grading/Survey Control Established - Clear and Grub), 0004 (Subgrade Compaction Inspection for Activity #0003), and 0037 (Material Receipt and Storage). These activities were evaluated to ensure that their conduct was in accordance with the approved ISMP. Details of these evaluations can be found in Section 3.2 of this SER. No instances of noncompliance with the requirements of the ISMP were identified.

In addition, the Contractor identified in Table 1 of its submittal the activities included within the scope of the LCAR. Where these activities were discussed in the body of the LCAR, applicable regulatory commitments from the SRD and ISMP were identified. For example, the LCAR, Section 3, "Management Control Systems," cited SRD Safety Criteria 1.0-10, 4.0-1, 4.0-2; all of Section 7.3; and the ISMP, Sections 1.3.13, 1.3.16, and 5.3 as requirements for management control systems needed for limited construction. The reviewers evaluated the LCAR submittal against the regulatory commitments in the applicable SRD and ISMP sections and one item of noncompliance were identified. SRD Safety Criterion 4.1-2 lists as one of the implementing standards ASTM D2922, "Standard Test Method for Laboratory Determination of Moisture Content of Soil." However, Section 1.3.1.25, "Soil Compaction Testing," of the LCAR identified ASTM D2922 as "Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)." In response to OSR Questions 01-LCAR-002-Q,

the Contractor confirmed that the LCAR title for ASTM D2922 was correct. The Contractor committed that a proposed change to the SRD to correct the error would be submitted. This response was found to be acceptable.

A determination of whether the Contractor's quality-related activities are being conducted according to its approved ISMP will be made in conjunction with the LCA Readiness Inspection, scheduled for August 2001.

3.8.4 Conclusions

The compliance of proposed limited construction activities with the SRD and ISMP was found to be acceptable. The reviewers concluded that the Contractor's prposed activities would comply with the SRD and ISMP. Further, the Contractor committed in the LCAR (Section 8) that those SRD and ISMP requirements applicable to other project activities that are not cited in the LCAR are not excluded during limited construction. As such, the reviewers concluded that the LCAR contained no exceptions to, and complied with, the SRD and ISMP.

The OSR will conduct an LCA Readiness Inspection, scheduled for August 2001, to establish that the Contractor has implemented adequate measures to comply with the SRD and ISMP once limited construction is authorized.

4.0 RECOMMENDATIONS

4.1 Recommendation for Approval

Approval of the LCAR is recommended subject to the conditions identified in Section 4.2 below. This recommendation is based on the following conclusions:

- The Contractor confirmed that the activities covered by the LCAR provided adequate safety for facility workers, co-located workers, the public, and the environment.

- The Contractor adequately justified the need for the LCA in advance of construction authorization.

- The Contractor provided sufficient basis for identifying and classifying important-to-safety SSCs to be installed under the LCA.

4.2 Conditions of Approval

The following conditions of approval of the LCAR were identified:

- Construction authorization shall be for the specific activities defined in the LCAR[28] and issued for bid drawings[29] with the exception that the stainless steel liners are not authorized to be included.

- The Contractor shall update the LCAR prior to limited construction authorization to include the additional details and clarifications provided in question responses: 01-LCAR-001-Q; 01-LCAR-005-Q; 01-LCAR-008-Q; 01-LCAR-012-Q; 01-LCAR-014-Q; 01-LCAR-019-Q; 01-LCAR-020-Q; 01-LCAR-021-Q; 01-LCAR-022-Q; 01-LCAR-023-Q; 01-LCAR-024-Q; 01-LCAR-025-Q; 01-LCAR-026-Q; 01-LCAR-027-Q; 01-LCAR-028-Q; and 01-LCAR-029-Q.

- The year and revision for standards shall be as specified in the SRD and LCAR. If the year or revision is not specified, the most current version shall apply.

5.0 REFERENCES

10 CFR 820, Appendix A, "General Statement of Enforcement Policy," *Code of Federal Regulations*, as amended.

10 CFR 830.120, "Quality Assurance Requirements," *Code of Federal Regulations*, as amended.

10 CFR 835, "Occupational Radiation Protection," *Code of Federal Regulations*, as amended.
Part 101, "Radiation Protection Program"
ACI-318 Building Code, American Concrete Institute, 1999.

ASTM D3740, "Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction," American Society of Testing Materials.

Final Report, Geotechnical Investigation Report, River Protection Project Waste Treatment Plant, WTSC-1035-42-17, April 2000.

Quality Assurance Manual, 24590-WTP-QAM-QA-01-001, Rev. A, Bechtel National, Inc., 2001.

DOE G 440.1, *Implementation Guide for Use with DOE Orders 420.1 and 440.1 Fire Safety Program*, U.S. Department of Energy, 1995.

DOE M 232.1-1A, "Occurrence Reporting and Processing of Operations Information," U.S. Department of Energy, 1997.

[28] CCN: 020503, BNI letter, A. Veirup to M. Barrett, ORP, "Request for Review and Approval of the Limited Construction Authorization Request for the River Protection Project," dated June 5, 2001.
[29] CCN: 020564, BNI letter, A. Veirup to M. Barrett, ORP, "Updated Drawings for use in Review and Approval of the Limited Construction Authorization Request for the River Protection Project-Waste Treatment Plant," dated June 7, 2001.

DOE/RL-96-0003, *DOE Process for Radiological, Nuclear, and Process Safety Regulation of the RPP Waste Treatment Plant Contractor*, Rev. 2, U.S. Department of Energy, Office of River Protection, 2001.

DOE/RL-96-0006, *Top-Level Radiological, Nuclear, and Process Safety Standards and Principles for the RPP-WTP Contractor*, Rev. 2, U.S. Department of Energy, Office of River Protection, 2001.

DOE-STD-1066-97, *Fire Protection Design Criteria*, U.S. Department of Energy, 1997.

Geotechnical Investigation Report, "Final Report, Geotechnical Investigation, River Protection Project-Waste Treatment Plant, WTSC-1035-42-17."

Integrated Safety Management Plan (ISMP), BNFL-5193-ISP-01, Rev. 6, 2001.

IR-01-001, *Training and Qualification Inspection*, U.S. Department of Energy, Office of River Protection, 2001.

NFPA Standard 13, "Standard for the Installation of Sprinkler Systems," National Fire Protection Association, 1999.

NFPA Standard 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*, National Fire Protection Association, 1995.

NFPA Standard 801, "Standard for Fire Protection for Facilities Handling Radioactive Materials," National Fire Protection Association, 1998.

ORP/OSR-2001-10, Office of Safety Regulation Evaluation of the River Protection Project Waste Treatment Plant Contractor's Quality Assurance Manual, Rev. 0, U.S. Department of Energy, Office of River Protection, 2001.

Radiation Protection Program for Design and Construction, BNFL-TWP-SER-003, Rev. 8, Bechtel National, Inc., 2001.

RL/REG-96-01, *Guidance for Review of the RPP-WTP Contractor Quality Assurance Program*, Rev. 2, U.S. Department of Energy, Office of River Protection, 2001.

RL/REG-97-13, *Office of Safety Regulation Position on Contractor-Initiated Changes to the Authorization Basis*, U.S. Department of Energy, Office of River Protection, 2001.

RL/REG-98-06, *Corrective Action Program Description*, Rev. 3, U.S. Department of Energy, Richland Operations Office, 1999.

RL/REG-98-11, *Guidance for Review of the RPP-WTP Contractor Radiation Protection Program Document Required by 10 CFR 835, Occupational Radiation Protection,* Rev. 2, U.S. Department of Energy, Richland Operations Office, 2000.

RL/REG-98-26, *Inspection Technical Procedures*, U.S. Department of Energy, Office of River Protection, 2001.

I-127, Rev. 0, "Readiness for Limited Construction Inspection"

RL/REG-99-17, *Review Guidance for the Limited Construction Authorization Request (LCAR),* Rev. 4, U.S. Department of Energy, Office of River Protection, 2001.

RL/REG-2000-14, *Quality Assurance Program Planning Handbook*, Rev. 1, U.S. Department of Energy, Office of River Protection, 2001.

Safety Requirements Document (SRD), BNFL-5193-SRD-01, Volumes I and II, Rev. 2, BNFL Inc., 1998.

6.0 LIST OF TERMS

AHJ	Authority Having Jurisdiction
AMSQ	Assistant Manager for Safety Quality and Health
BNI	Bechtel National, Inc.
CFR	Code of Federal Regulation
DOE	U.S. Department of Energy
EIS	environmental impact statement
ERPP	Environmental Radiation Protection Plan
HLW	high-level waste
ISM	integrated safety management
ISMP	Integrated Safety Management Plan
LAW	low-activity waste
LCA	Limited Construction Authorization
LCAR	Limited Construction Authorization Request
NEPA	National Environmental Protection Act
NFPA	National Fire Protection Association
NPH	natural phenomena hazards
NRC	U.S. Nuclear Regulatory Commission
ORP	Office of River Protection
OSR	Office of Safety Regulation
QA	quality assurance
QC	quality control
RCP	Radiological Control Program
RPP-WTP	River Protection Project-Waste Treatment Plant
SER	Safety Evaluation Report
SRD	Safety Requirements Document
SRO	Safety Regulation Official
SSCs	structures, systems, and components

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Appendix A. OSR Questions and Contractor Responses

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-001-Q	**Date Opened: 6/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01 and 7/26/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: P. Carier**

Description:

Review Guidance: Section 3.2.3.3, Regulatory Acceptance Criteria, requires a description of a program that includes a Construction Occurrence Reporting Plan and that this plan should be consistent with incident reporting and investigation standards.

LCAR Reference: Section 5, Notification, Categorization and Consequence Assessment, references several SRD Safety Criteria, DOE Manual 232.1-1A, and several ISMP requirements. In some cases the referenced material is followed by a brief description of its applicability. These references provide a description of general requirements relevant to incident reporting and investigation for limited construction. However, the material provided in the section did not describe how these requirements interrelate and how these requirements formulate the elements of a Construction Occurrence Reporting Plan (Table S7-1 deliverable) discussed in Section 3.2.4, Review Procedures, of the LCAR Review Guidance.

Question: In order to verify the adequacy of BNI's Construction Occurrence Reporting Plan (or portions thereof applicable to limited construction), please explain:

What types of incidents will be addressed under the program for limited construction?

What are the criteria for reporting incidents (i.e., reporting thresholds)?

What methodology will be used to notify the appropriate regulatory authorities?

When will incidents be reported (timeliness criteria)?

How will incident reports be initiated, reviewed, and approved?

How will incidents be investigated?

How will incident causes be determined and appropriate actions identified, tracked and implemented?

How will BNI assign responsibility with regard to incident reporting and investigation?

01-LCAR-001-Q, continued

Contractor Response:

Questions 1 and 2

Following are the types of incidents and criteria for reporting that will be included in the occurrence reporting procedure to be used during limited construction. The groups are as defined in DOE Manual 232.1-1A and have been modified to address the specific hazards associated with the construction phase of the RPP-WTP.

Categorization of Occurrences by Group

Group 1-Facility Condition

Fires/Explosions

Off-Normal

(1) Any fire or explosion not required to be reported as an Unusual Occurrence that activates a fire suppression system (e.g., halon discharge, sprinkler heads activating) or seriously disrupts a significant amount of work activities at the construction site.

(2) An unplanned fire that takes longer than 10 minutes to extinguish following the arrival of fire protection personnel; this does not include fires that do not disrupt normal facility operations and which are in the initial or beginning stage that can be controlled or extinguished by portable fire extinguishers, Class II standpipe, or small hose systems without the need for protective clothing or breathing apparatus.

Loss of Control of Radioactive Material/Spread of Radioactive Contamination

Note: The Radiological Control Manger will provide information necessary and will assist in categorization of any event within this group.

Unusual Occurrence

(1) Identification of radioactive contamination offsite in excess of 100 times any of the surface contamination levels specified in DOE 5400.5, RADIATION PROTECTION OF THE PUBLIC AND THE ENVIRONMENT, Figure IV-1, that has not been previously identified and formally documented. For the first group listed in Figure IV- 1 (i.e., transuranics...) use the values specified in Attachment E.

(2) Loss of accountability of a sealed source or identification of lost radioactive material that exceeds 100 times the quantities specified in DOE N 441.1, RADIOLOGICAL PROTECTION FOR DOE ACTIVITIES.

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Off-Normal

(1) Any unplanned spill of liquids in excess of one gallon, contaminated with radioactive material in concentrations greater than five times the Derived Concentration Guide values listed in DOE 5400.5, Figure III-1.

(2) Identification of radioactive contamination outside a radiological area (as defined in 10 CFR 835, Occupational Radiation Protection) or radiological buffer area established for contamination control, but within a Controlled Area, in excess of 10 times the total contamination levels in 10 CFR 835, Appendix D. For tritium, until a total contamination value is specified by 10 CFR 835 Appendix D, report contaminations in excess of 10 times 10,000 dpm/100cm2.

(3) Identification of radioactive contamination onsite that is not located within a Controlled Area, Fixed Contamination Area, or Soil Contamination Area, and is in excess of two times the total contamination levels in 10 CFR 835, Occupational Radiation Protection, Appendix D.

(4) Identification of radioactive contamination offsite in excess of any of the surface contamination levels, specified in DOE 5400.5, Figure IV-1, that has not been previously identified and formally documented. For the first group listed in Figure IV- 1 (i.e., transuranics, etc.) use the values specified in Attachment E.

(5) Loss of accountability of a sealed source or identification of lost radioactive material that exceeds ten times and is less than 100 times the quantities specified in DOE N 441.1, RADIOLOGICAL PROTECTION FOR DOE ACTIVITIES.

(6) Loss of accountability of a sealed source or identification of lost radioactive material that is one to ten times the quantities specified in DOE N 441.1, RADIOLOGICAL PROTECTION FOR DOE ACTIVITIES.

Violation/Inadequate Procedures

Off-Normal

(1) Any violation resulting in actual equipment damage in excess of $10,000.

(2) Use of inadequate procedures or deviations from written procedures that result in adverse effects on performance, safety, or reliability.

Operations

Unusual Occurrence

(1) Weather conditions/natural phenomenon causing serious disruption of work activities at the construction site.

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(2) Any facility evacuation (excluding office space) in response to an actual occurrence, not including a precautionary evacuation, for an event that can be controlled and mitigated by employees or maintenance personnel assigned to the affected facility or activity.

Off-Normal

(1) Any unplanned and unexpected change in a process condition or variable adversely effecting safety, security, environment, or health protection performance sufficient to require termination (stopping or putting on hold) of a procedure related to major construction activities for greater than 4 hours.

Note: This does not apply when the procedure or plan governing performance of the procedure contains direction to stop or hold when certain conditions are encountered. This does not apply when stopping to clarify or question a procedure, retrieve tools, supplies, parts, and when responding to alarms or evacuations.

(2) Any unplanned electrical outages or unexpected consequences from a planned outage which seriously disrupt construction activities for one week

(3) Any unplanned outages of service systems (i.e., cooling water, steam, phones, communication systems, etc.) or unexpected consequences from a planned outage which: -

- disrupt construction activities for one week or longer
- which adversely effect safety, security, environment, or health protection performance.

Group 2 - Environmental

Release of Hazardous Substances/Regulated Pollutants/Oil

Unusual Occurrence

(1) Release of a hazardous substance, or regulated pollutant that exceeds a Comprehensive Environmental Response, Compensation, and Liability Act reportable quantity per 40 CFR 302 and 40 CFR 355 for chemicals and extremely hazardous substances.

(2) Any release that is not an Emergency as defined by DOE O 151.1, COMPREHENSIVE EMERGENCY MANAGEMENT SYSTEM but which requires immediate (less than 4 hours) reporting to Federal regulatory agencies or triggers specification action levels for an outside Federal agency.

(3) Any discharge of 100 gallons or more of oil of any kind or in any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil.

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Off-Normal

(1) Release of a hazardous substance or regulated pollutant to controlled or uncontrolled areas that is not part of a normal, monitored release and which exceeds 50% of a Comprehensive Environmental Response, Compensation and Liability Act reportable quantity as specified for such material per 40 CFR 302.

(2) Any discharge of greater than 42 gallons but less than 100 gallons of oil of any kind or in any form: including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil outside of a permitted containment area.
(3) Any detection of a toxic or hazardous substance in a sanitary or storm sewer, waste or process stream, or any holding points where such a material is not expected to be found, considering the current detection method and historical detection method used.

Note: Detection means confirmation of toxic or hazardous substance by analysis

(4) Any controlled, uncontrolled, or accidental release not classified as an Unusual Occurrence but which will be reported in writing to State/local agencies in a format other than routine periodic reports.

Note: Oral notifications to regulatory agencies that are considered "courtesy" will not be categorized as an occurrence. Courtesy Oral notification requiring a follow-up written report to a regulatory agency will also not be categorized as an occurrence.

(5) Any controlled release of hazardous/regulated material that occurs as a monitored part of normal operation but exceeds what historical data and/or analysis shows is expected as a result of normal operations.

(6) Any general environmental monitoring where concentration increases to a level which exceeds what historical data and/or analysis shows is expected as a result of normal operations.

Hazardous Material Contamination

Unusual Occurrence

Discovery of onsite or offsite contamination due to DOE operations that does not represent an immediate threat to the public but exceeds a reportable quantity for such material per 40 CFR 302.

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Off-Normal

Discovery of onsite contamination due to DOE operations that exceeds 50% of a reportable quantity for such material per 40 CFR 302.

Ecological Resources

Unusual Occurrence

Any occurrence causing significant impact to any ecological resource for which the DOE is a trustee (i.e., destruction of a critical habitat, damage to a historic/archeological site, damage to wetlands, etc.).

Environmental Agreement/Compliance Activities

Unusual Occurrence

Any occurrence under any agreement or compliance area that requires notification of an outside regulatory agency within 4 hours or less, or triggers any outside regulatory agency action level.

Note: Oral notifications to regulatory agencies that are considered "courtesy" will not be categorized as an occurrence. Courtesy Oral notification requiring a follow-up written report to a regulatory agency will also not be categorized an occurrence.

Off-Normal

(1) Any agreement, compliance, remediation or permit-mandated activity for which formal notification of enforcement has been received from the relevant outside regulatory agency that a site/facility is considered to be in noncompliance with a schedule or requirement (e.g., Notice of Violation, Notice of Deficiency, Notice of Intent to Sue, Notice of Noncompliance, Warning Letter, Finding of Violation, Finding of Alleged Violation, or a similar type enforcement action).

(2) Any occurrence under any agreement or compliance area that will be reported to outside agencies in a format other than routine periodic reports.

Note: Oral notifications to regulatory agencies that are considered "courtesy" will not be categorized as an occurrence. Courtesy Oral notification requiring a follow-up written report to a regulatory agency will also not be categorized an occurrence.

Group 3 - Personnel Safety

Note: The Industrial Safety Manager will provide necessary information and assistance in making these categorizations

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Occupational Illness/Injuries

Unusual Occurrence

(1) Any occurrence due to DOE operations resulting in a fatality or terminal injury or illness.

(2) Any one occurrence resulting in 3 or more lost workday cases as defined by 29 CFR 1904.12.

(3) Any occurrence requiring in-patient hospitalization of 3 or more personnel or that has a high probability of resulting in a permanent disability.

(4) Personnel exposures to sufficient levels of hazardous substances or hazards that require the administration of medical treatment on the same day as the exposure and are above limits established by the Occupational Safety and Health Administration (refer to 29 CFR 1910) or American Conference of Governmental Industrial Hygienists (ACGIH), whichever is lower. These should include:

a) Noise
b) Non-ionizing radiation
c) Chemical Agents
d) Physical Agents
e) Biological Agents

(5) Exposures to an Immediately Dangerous to Life and Health (IDLH) (as defined by 29 CFR 1910.120) condition without both appropriate personal protective equipment and procedures in place.

Off-Normal

(1) Any occupational illness or injury that results in inpatient hospitalization.

(2) Series of occupational illnesses from one event involving 3 or more people where at least one is a lost work day case.

(3) Personnel exposure in a single event to hazardous substances or hazards in excess of limits, as established by the Occupational Safety and Health Administration (refer to 29 CFR 1910), or American Conference of Governmental Industrial Hygienists (ACGIH), whichever is lower. These should include:

a) Noise
b) Non-ionizing radiation
c) Chemical Agents
d) Physical Agents
e) Biological Agents

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Vehicular Incidents

This section covers vehicular transportation incidents. Group 6 should also be considered in categorization for reporting. Transportation incidents without injury (e.g., those involving hazardous or radioactive material or financial loss) must be reported per the requirements of Group 6 or 7.

Unusual Occurrence

1) Any vehicular incident resulting in fatality(s), injury(s), or illness classified under Group 3, **Occupational Illness/Injuries**, Unusual Occurrence.

2) Any vehicular incident involving departmental property with a fatality(s) to a person(s) other than DOE personnel or DOE contractor personnel

Off-Normal

(1) Any vehicular incident with injury(s) involving departmental property resulting in a lost workday case.

(2) Any vehicular incident involving departmental property with injury(s) to a person(s) other than DOE personnel or DOE contractor personnel.

Safety Concerns

Off-Normal

(1) Unapproved use of flammable, toxic, explosive, corrosive, or other unsafe or dangerous processes, chemicals, materials, or methods not in accordance with standard operating procedures or work plans.

(2) Any shutdown of a work activity taken as a result of an Occupational Safety and Health Administration violation (e.g., trenching without adequate shoring or working at elevated levels without fall protection, when required).

Group 4 - Personnel Radiological Protection

Note: The Radiological Safety Manager will provide necessary information and assist in making these categorizations.

Radiation Exposure

Unless specified otherwise, all doses specified in the following requirements are calculated as the total effective dose equivalent, which is the sum of the committed effective dose equivalent due

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to radionuclides taken into the body (internal exposure) and the effective dose equivalent due to external exposure.

Unusual Occurrence

Determination of a dose that exceeds the limits specified in 10 CFR 835, Subpart C, Occupational Radiation Protection (for onsite exposure) or DOE 5400.5, Chapter II, Section 1 (for offsite exposures to a member of the public).

Off-Normal

(1) Any single occupational exposure that exceeds an expected exposure by 100 mrem.

(2) A single unplanned exposure onsite to a minor or member of the public that exceeds 50 mrem.

(3) Determination of a dose that exceeds the reporting requirement thresholds specified in DOE 5400.5, Chapter II, Section 7, for offsite exposures to a member of the public.

Personnel Contamination

Unusual Occurrence

(1) Any single occurrence resulting in the contamination of five or more personnel or clothing (excluding protective clothing) measured (prior to washing or decontamination) in accordance with DOE Radiological Control Manual, Article 338, or equivalent, at a level exceeding the values for total contamination limits identified in 10 CFR 835, Occupational Radiation Protection, Appendix D. The contamination level shall be based on direct measurement and not averaged over any area.

(2) Any occurrence requiring offsite medical assistance for contaminated personnel.

(3) Identification of personnel or clothing contamination offsite due to DOE operations in accordance with approved radiological procedures for determining personnel and/or clothing contamination, measured (prior to washing or decontamination) in accordance with the Radiological Control Manual, Article 338, or equivalent.

Off-Normal

(1) Any measurement of personnel or clothing contamination (excluding protective clothing) at a level equal to or exceeding five times the total contamination limits identified in 10 CFR 835, Occupational Radiation Protection, Appendix D, measured (prior to washing or decontamination) in accordance with the DOE Radiological Control Manual Article 338, or equivalent. The contamination level shall be based on direct measurement and not averaged over any area.

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(2) Any measurement of personnel or clothing contamination (excluding protective clothing) at a level exceeding but less than five times the total contamination limits identified in 10 CFR 835, Occupational Radiation Protection, Appendix D, measured (prior to washing or decontamination) in accordance with the DOE Radiological Control Manual Article 338, or equivalent. The contamination level shall be based on direct measurement and not averaged over any area.

Group 5 - Safeguards and Security

Criminal Acts

Initial notification of events in this section shall follow normal occurrence reporting timelines. When reporting an occurrence that is the subject of an ongoing investigation under this subgroup, the report shall be tailored to prevent jeopardizing the investigation. Full reporting may be delayed until completion of criminal investigations, if the reports would jeopardize the investigation.

Unusual Occurrence

(1) Violent assault/battery, murder, or unjustified use of deadly force while on DOE property.

(2) Theft/diversion/intentional destruction of Government property valued greater than $1,000,000.

(3) Racketeering or other organized criminal activity onsite.

Off-Normal

(1) At DOE facilities other than reactors and nonreactor nuclear facilities:

a) location of a suspicious device or noncredible bomb threat;
b) noncredible terrorist threat
c) noncredible sabotage threat.

(2) Theft/diversion/intentional destruction of government property valued between $10,000 and $1,000,000.

(3) Onsite felony conspiracies (i.e., blackmail, fraud, embezzlement, extortion and forgery) not involving classified information.

Substance Abuse

Off-Normal

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(1) Any reportable occurrence under this procedure at least partially attributable to the use of alcohol or illegal drugs. "Partially attributable to the use of alcohol or illegal drugs" is defined when an employee is drug tested and receives a confirmed positive test for substances at the levels identified in the RPP-WTP internal procedure.

(2) A detection of personnel not fit for duty attributable to the use of alcohol or illegal drugs. "Not fit for duty" is defined when an employee is drug tested and receives a confirmed positive test for substances at the levels identified in the RPP-WTP internal procedures.

Intelligence Activities

Unusual Occurrence

Espionage, intelligence activities, treason, or subversive activities by or directed at DOE or DOE contractor personnel.

Off-Normal

When DOE or DOE contractor personnel believe that they may be the target of an attempted exploitation by an inimical interest, foreign or domestic.

Physical Security System Computer

Unusual Occurrence

Discovery of a computer incident (virus, hacker, sniffer, abuse, fraud, etc.) involving a physical security system that causes an alteration to a security feature, disruption of service, or loss of the confidentiality, integrity or availability of information, and results in an estimated $1,000,000 or more in damages or the cost of restoring services.

Off-Normal

Discovery of a computer incident (virus, hacker, sniffer, abuse, fraud, etc.) involving a physical security system that causes an alteration to a security feature, disruption of service, or loss of the confidentiality, integrity or availability of information, and results in an estimated $10,000 or more in damages or the cost of restoring services.

Unplanned/Unscheduled Outage of Site Security System

Off-Normal

Unplanned/unscheduled outage of any site security system, or major component of a site security system, not encompassed by the Unusual Occurrence category, that is not redundant and not

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authorized by a facility shutdown plan or a special security plan approved by DOE, that requires the physical presence of the protective force as a compensatory measure to prevent unauthorized access. This does not include the stationing of protective forces as a backup security system identified in a DOE approved facility security plan.

Demonstrations/Protests

Unusual Occurrence

(1) Disruptive activities impeding vehicular or employees access/egress to the facility.

(2) Attempted or actual trespass. Interpreted as protesters attempting to or gaining access into the facility.

(3) Malevolent activities causing property damage or bodily harm.

Off-Normal

Lawful activities warranting deployment of additional protective measures.

Firearms

Unusual Occurrence

Unauthorized firearms discharge resulting in personnel injury.

Off-Normal

Unauthorized firearms discharge resulting in no personnel injury.

Other Security Concerns

Unusual Occurrence

Unauthorized use, possession, or alteration of a security badge, credential, shield, or other form of official identification (to include blank badge stock/form) to gain access to the facility.

Off-Normal

(1) Discovery of prohibited items within the fenced area of the facility that:

a) are suspected of being positioned for the purpose of aiding and abetting a malevolent act; or
b) are, of themselves, illegal

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Note: Items discovered outside the fenced area of the facility that are legal under Federal, State, and local laws are not reportable, even if the discovery of such items would otherwise be reportable under this paragraph.

(2) Onsite death of cleared DOE or DOE contractor personnel by unnatural causes (e.g., suicide, drug overdose).

(3) Loss of security badges in excess of 5 percent in a calendar year.

(4) Onsite malicious mischief, disorderly conduct, or vandalism which disrupts facility activity for grated than one hour or causes damage between $10,000 and $100,000 at the facility.

Group 6 - Transportation

Transportation of DOE Hazardous Materials. Transportation occurrences are incidents related to the transportation of DOE materials, including hazardous materials, hazardous substances, and hazardous wastes by vehicular, vessel, air, or rail mode. The requirements for reporting noncompliances and violations associated with such transfers are qualified in this procedure. The Federal regulations for offsite transportation are found in 10 CFR Part 71, 49 CFR Parts 106-180, 200-250, and 350-399, 46 CFR (vessel), ICAO/IATA, IMDG, 14 CFR (aviation), and several DOE Orders. For onsite transportation (within controlled boundaries of the facility), the transportation regulations for hazardous materials transfers are the same as offsite (DOT's Hazardous Materials Regulations) or as defined in an approved facility Transportation Safety Document.

DOE facilities receiving materials from a DOE shipper that are not in compliance with appropriate regulations, as qualified by this procedure, must report the discrepancies to the DOE shipper who will prepare an Occurrence Report and implement suitable corrective actions. If such a shipment is received from a non-DOE shipper and meets the reporting criteria of this Manual, the DOE organization will notify the non-DOE shipper of the apparent noncompliance and will prepare an Occurrence Report stating that the non-DOE shipper has been notified. These reporting criteria are in addition to any required by DOT for contractors subject to the DOT regulations.

Unusual Occurrence

(1) Any packaging or transportation activity (including loading, unloading, or temporary storage) involving the offsite release of radioactive material, etiologic agents, a reportable quantity of hazardous substance, or marine pollutants.

(2) Any shipment of radioactive material that arrives at its destination with radiation or contamination levels greater than DOT limits, or results in personnel radiation exposure higher than permitted in Federal permits, Federal regulations, or DOE standards.

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(3) Any shipment or onsite transfer of radioactive material or hazardous waste that arrives at its destination with an unaccounted for package or an irreconcilable shipping paper, waste manifest, or onsite transfer authorization.

(4) A vehicle, vessel, rail or air incident or accident (without personal injury) that presents significant impact on the ability of a facility to conduct transportation operations and:

a) results in release of radioactive or hazardous materials above Federal permit, Federal regulatory, or DOE Standard limits
b) involves performance degradation of safety equipment
c) is the result of failure or degradation of administrative controls required to ensure safety.

(5) Violations of the Federal Motor Carrier Safety Regulations or the Hazardous Materials Regulations if those violations are determined by DOT inspection and result in a fine (monetary penalty).

Off-Normal

(1) Any packaging or transportation activity involving:

a) the offsite release of non-radioactive hazardous material, or any quantity of hazardous waste
b) the onsite release of radioactive materials, etiologic agents, hazardous substances, hazardous waste, or marine pollutants.

(2) A vehicle, vessel, rail or air incident or accident (without personal injury) that affects the ability of a facility to conduct transportation operations and:

a) results in release of radioactive or hazardous materials below limits established by Federal permits, Federal regulations, or DOE Standard limits but must be reported to State or local agencies
b) is the result of operational procedural violations, including maintenance or administrative procedures.

(3) Noncompliances (potential violations) of the DOT Hazardous Materials Regulations or the transportation and packaging requirements of the Nuclear Regulatory Commission involving:

a) errors made by the shipper in materials description, marking, labeling, or placarding
b) an unqualified person signing shipping papers
c) the highway routing selection requirements for highway route controlled shipments or the notification requirements for spent-fuel shipments not being observed
d) the separation and segregation tables for hazardous materials not strictly adhered to
e) the applicable packaging requirements for the assembly, handling, or selection of a package not being in accordance with the applicable regulations

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(4) Noncompliances (potential violations) of the Federal Motor Carrier Safety Regulations involving:

a) a contractor driver operating a DOE-owned motor vehicle after a positive drug test or failure of an alcohol test
b) an unqualified driver operating a vehicle (medical, driver's license, or training not in compliance)
c) the carrier (contractor management) not having required insurance
d) a vehicle that failed inspection not being removed from service
e) a specification cargo tank with expired inspection being in service with hazardous materials
f) a driver's log book is deliberately misrepresented
g) the carrier (contractor management) failing to perform random or periodic drug or substance-abuse testing.

(5) Any violation of the Hazardous Material Regulations or Federal Motor Carrier Safety Regulations if that violation is determined by DOT inspection and does not result in a penalty.

Group 7 - Value Basis Reporting

Value basis reporting includes items based on cost or the identification of defective items, materials, or services. A defective item, material, or service shall be identified and reported to allow the initiation of a Headquarters investigation and make all Departmental Elements aware of the defect and initiate actions to eliminate common mode failures due to substandard, counterfeit, misrepresentation, or fraudulent practices of suppliers.

Cost Based Occurrences

Any occurrence specifying cost as a basis for reporting, unless otherwise stated, will be classified by the following monetary values necessary to repair, replace, or otherwise restore a facility/system/component to acceptable operation. Costs used for reporting should be reasonable initial estimates.

Unusual Occurrence

Estimated loss or damage to DOE or other property amounting to $1,000,000 or more, or estimated costs of $1,000,000 or more required for cleaning (including decontamination), renovating, replacing, or rehabilitating structures, equipment, or property.

Off-Normal

Estimated loss or damage to DOE or other property amounting to between $10,000 and $1,000,000 (for vehicle/aircraft the lower limit is $5,000 or, for insurance purposes, considered a

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total loss. Such damage to vehicles has to occur as the result of one accident not as the result of multiple accidents over an extended period of time) or estimated costs within these limits required for cleaning (including decontamination), renovating, replacing or rehabilitating structures, equipment, or property.

Defective Item, Material, or Service

Off-Normal

(1) Discovery of any actual or potential defective item, material, or service, including any suspect, counterfeit, or substandard product, in any application whose failure could result in a substantial safety hazard. Examples include the identification of suspect, counterfeit or substandard products found in:

a) cranes, elevators, and fork lifts - items used in the critical load bearing path of such handling and lifting equipment
b) aircraft - items used in engines or to attach engines, wings, tails, or landing gear
c) vehicles - items used in engines, brakes or steering mechanisms
d) critical components used in personnel safety equipment
e) facilities
    1. items used to contain:
        a. radioactive fluids
        b. high temperature or pressure steam or fluids
        c. other hazardous material
    2. Safety Class SSCs or Safety Significant SSCs supporting the safe operation or shutdown of a facility, system, or process that could result in a performance degradation.

(2) Discovery of any actual or potential defective item, material, or service, including any suspect, counterfeit, or substandard product, in any application whose failure could not result in a substantial safety hazard. This does not include office supplies, equipment, or household products.

Note: The definition of defective item, material, or service does not include parts or services which fail or are otherwise found to be inadequate because of random failures or errors within accepted reliability levels.

Group 8 - Facility Status

This section involves the change of facility status that may affect the performance goals of a facility. The potential inability to meet performance goals may significantly affect other major and minor facilities throughout the complex. Performance goals are operating objectives necessary to accomplish an approved facility, process, or activity mission on a periodic basis.

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The duration of the goal may be short or long term, but should not exceed the goals of the annual operating plan.

Facility/Process/Activity Unscheduled Shutdown

Off-Normal

Any unscheduled shutdown of a facility, process, or activity that resulted or may result in the failure to meet approved performance goals.

Existing Facility/Process/Activity Shutdown Extension

Off-Normal

Any increase in an approved shutdown schedule of 1 month or greater or that resulted or may result in the failure to meet approved performance goals for an existing facility, process, or activity.

New Facility/Process/Activity Start-up Delay

Off-Normal

Any delay in an approved start-up schedule of 1 month or greater and which resulted or may result in the failure to meet approved performance goals for a new facility, process, or activity.

Group 9 - Nuclear Explosive Safety

Not applicable

Group 10 - Cross-Category Items A.

Collectively Significant Related Occurrences

Unusual Occurrence

A series of related occurrences which individually do not warrant reporting under preceding criteria but which collectively are considered significant enough to warrant reporting.

Off-Normal

A series of related occurrences which individually do not warrant reporting under preceding criteria but which collectively are considered significant enough to warrant reporting.

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Near Miss Occurrences

Unusual Occurrence

A near miss to one of the reporting classifications under preceding categories where the conditions necessary to cause an Unusual Occurrence existed (i.e., all barriers to event initiation were compromised).

Off-Normal

(1) A near miss to one of the reporting classifications under preceding categories where the conditions necessary to cause an Off-Normal Occurrence existed (i.e., all barriers to event initiation were compromised).

(2) A near miss to one of the reporting classifications under preceding categories where the conditions necessary to cause a reportable occurrence were prevented from existing by one remaining barrier after other barriers had been compromised (i.e., one additional independent failure/degradation was necessary for event initiation to be possible).

Potential Concerns/Issues

Unusual Occurrence

(1) An occurrence that may result in a significant concern, by the press or general population, particularly in the offsite transportation and radiological areas, or could damage the credibility of the Department.

(2) Identification of potential concerns or issues that are deemed to be worthy of reporting.

Off-Normal

(1) Any event resulting in the initiation of a Type A or B investigation as categorized by DOE O 225.1, ACCIDENT INVESTIGATIONS.

(2) Identification of potential concerns or issues, that are deemed to be worthy of reporting.

Question 3

The following methodology will be used to notify the appropriate regulatory authorities:

Off-Normal Occurrences

As soon as practical, the Facility Manager (FM) or the Facility Manager Designee (FMD) will

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notify the ES&H Manager, Responsible Manager (RM), Price Anderson Amendments Act (PAAA) Coordinator, and the ORP Facility Representative (FR) that an event has been categorized as an Off-Normal Occurrence.

Unusual Occurrences
The FM/FMD will notify the ES&H Manager, Responsible Manager (RM), Price Anderson Amendments Act (PAAA) Coordinator, and the ORP Facility Representative (FR) that an event has been categorized as an Unusual Occurrence as soon as practical, but within 2 hours of categorization.

DOE Headquarters Emergency Operations Center will be also be orally notified within 2 hrs of categorization of an Unusual Occurrence. A facsimile of the notification will also be provided to the DOE Headquarters Emergency Operations Center.

Follow-up Notifications

The FM/FMD will make follow-up notifications to the ES&H Manager, ORP FR, and the DOE Emergency Operations Center as soon as practical, but no later than 2 hours after recategorization of the following information:

- An Off-Normal Occurrence has been upgraded to a Unusual Occurrence.

- Any further degradation in the level of safety or impact on the environment, safeguards and security, health, or operations of the facility or other worsening conditions subsequent to the previous notifications.

Question 4

The timeliness of incident reporting is as follows:

Written notifications of all reportable occurrences will be provided to the regulator before the close of the next business day from the time of the categorization of the occurrence (not to exceed 80 hours). An Update Occurrence Report shall be submitted when significant new information (including changes in categorization) is available.

Completion of the Final Occurrence Report is required when the analysis of the occurrence has been completed, root cause and contributing cause(s) finalized, corrective action(s) determined and scheduled, and lessons learned identified. The Final Occurrence Report will be submitted to the regulator within 45 days of categorization of the occurrence. If the required analysis cannot be completed within 45 calendar days after categorization, an Update Report shall be submitted within 45 days. The Update Report shall explain the delay and provide an estimated date for submittal of the Final Report.

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Questions 5 and 6

Incident investigation and report initiation, review, and approval are as follows:

After the occurrence, the FM/FMD will initiate the collection of information pertaining to the event. Collection of data will be conducted with the assistance of the Responsible Manager or other individuals deemed necessary.

A graded approach will determine the level of effort required to investigate the cause of an occurrence. The graded approach is based on the severity or risk associated with the event. Using the graded approach, all occurrences must have some degree of investigation. The investigation can take the form of a meeting with involved individuals, a single person gathering information, or a Root Cause Analysis Team trained in accident investigation techniques conducting a formal investigation.

If determined to be necessary a critique will be conducted in accordance with approved procedure(s)

If a formal investigation is determined to be needed it will be conducted in accordance with approved procedure(s).

The FM/FMD will obtain approval of the ES&H Manager and the Site Manger or their designees prior to uploading the Final Occurrence Report into the ORPS database.

Question 7

Incident causes will be determined and appropriate actions identified, tracked, and implemented as follows:

The incident investigation process described above will determine the cause(s) and appropriate corrective/preventative actions.

A Final Occurrence Report will be uploaded into the ORPS database when an analysis of the occurrence has been completed, and the significance, nature, and extent of the event or condition identified, the root cause, contributing cause(s), direct cause(s) identified, corrective action(s) to be taken to correct the condition and prevent recurrence scheduled, and lessons learned identified. The ORPS database will be used to track identified actions to completion.

Question 8

Assignment of responsibilities with regard to incident reporting and investigation is as follows:

The responsibility for incident reporting is assigned to the FM/FMD. The FM/FMD will assign incident investigation responsibilities to the appropriate Responsible Manager using the graded approach described above.

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Construction Occurrence Reporting Plan for Limited Construction

During limited construction, incidents will be categorized, OSR will be notified, and reports will be generated and transmitted to OSR consistent with the requirements specified in SRD Safety Criteria 7.7-4, 7.7-5, 7.7-6, and 7.7-7 relative to "Unusual Occurrences" and "Off-Normal Occurrences" as described below. "Emergency" categorizations are not applicable prior to facility operation.

All RPP-WTP employees and subcontractors will be responsible for notifying their supervisor or manager immediately to report events and conditions which have caused or have the potential to cause adverse effects on safety, health, quality assurance, security, or have operational or environmental implications. Employee training will include:

- Each employee's duty to report occurrences
- Indoctrination in the philosophy of occurrence reporting
- Identification of reportable occurrences; their categorization, notification, and associated reporting requirements

The RPP-WTP Project Manager (PM) or designee will be immediately notified of potentially reportable conditions for categorization and notification/reporting to OSR. Offsite notification and reporting will be performed consistent with DOE M 232.1-1A, Sections 5.3.2 and 5.4, tailored as described below.

The PM or designee will verbally notify the OSR Safety Regulation Official (SRO) that an event has been categorized as a Off-Normal Occurrence as soon as practical.

The PM or designee will verbally notify the SRO that an event has been categorized as an Unusual Occurrence as soon as practical but within two hours of categorization.

The PM or designee will make follow-up oral notifications to the SRO as soon as practical, if the event has been re-categorized, but no later than two hours of the following information:

- An Off-Normal Occurrence has been upgraded to a Unusual Occurrence
- Any further degradation in the level of safety or impact on the environment, safeguards and security, health, or operations of the facility or other worsening conditions subsequent to the previous notifications

Written notifications of all reportable occurrences will be provided to the SRO before the close of the next business day from the time of the categorization of the occurrence (not to exceed 80 hours). An update shall be submitted when significant new information (including changes in categorization) is available.

Completion of the final report will be provided when the analysis of the occurrence has been completed, root cause and contributing cause(s) finalized, corrective action(s) determined and

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scheduled, and lessons learned identified. The final report will be submitted to the SRO within 45 days of categorization of the occurrence.

The written occurrence report will contain, at a minimum, the following information:

- An occurrence report number identifying the facility, the year of the occurrence, and the sequential number of the occurrence
- Category of the occurrence
- All systems, equipment, structural items, administrative controls, or procedures involved
- Date and time when the occurrence was discovered and categorized
- Date and time of notification of regulatory and state and local authorities
- A thorough and complete description of what occurred or the defect reported
- Immediate or remedial actions taken to correct or alleviate the anomalous condition, and the results of those actions
- Cause of the occurrence
- Recommendations about whether further evaluation is required
- Action taken or planned to correct the problem
- Impact of the occurrence
- Levels and types of contamination, human exposures, and known or projected environmental, safety, and health impacts, if applicable
- Lessons learned from the occurrence that should be addressed in personnel training or facility procedures
- Any previous similar events at the same facility that are known
- PAAA reportability determination (PAAA Reportable/PAAA Below Threshold/Not PAAA Reportable)

The types of incidents that will be reported to the SRO during limited construction and the reporting thresholds are as follows:

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Incident Type	Reporting Threshold	Category
Programmatic breakdown	Systematic failures of one or more administrative controls described in the AB that results in 1) multiple instances of nonconforming conditions, or 2) indeterminate conformance with the AB	Off-Normal
Facility or activity not in conformance with an authorization agreement or associated AB	(1) An activity that is not bounded by the Limited Construction Authorization Agreement that could affect radiological, nuclear, or process safety (RNPS) (i.e., any activity that could involve a radiological hazard during limited construction or that could affect RNPS for the completed RPP-WTP facility that is not addressed in the AB and authorized in the Limited Construction Authorization Agreement.	Off-Normal
	(2) A substantial nonconformance with an authorization agreement or associated AB (i.e., nonconformance that, if uncorrected, could have a serious effect on safety, operability of systems, structures or components, or product quality or is determined to be reportable under the PAAA)	Off-Normal
Defect in the AB	A significant deficiency, excluding typographical or editorial errors (i.e., correcting the AB would require prior OSR approval of the change). Example: A non-ITS LCAR activity is determined to be ITS	Off-Normal
Events with radiological safety significance	Events related to activities involving the use of industrial radioactive sources or material requiring the notification of a federal, state, or local entity not otherwise reportable under this plan.	Off-Normal
	A measurement of personnel or clothing contamination (excluding protective clothing) at a level exceeding the total contamination limits identified in 10 CFR 835, Occupational Radiation Protection, Appendix D, measured (prior to washing or decontamination) in accordance with the WTP Radiological Control Manual Article 338. The contamination level shall be based on direct measurement and not averaged over any area.	Off-Normal
	A single occurrence resulting in the contamination of five or more personnel or clothing (excluding protective clothing) measured (prior to washing or decontamination) in accordance with WTP Radiological Control Manual, Article 338, at a level exceeding the values for total contamination limits identified in 10 CFR 835, Occupational Radiation Protection, Appendix D. The contamination level shall be based on direct measurement and not averaged over any area.	Unusual Occurrence

Incident Type	Reporting Threshold	Category
	Radiation exposure relative to the use of industrial sources such as soil density gauges or radiography cameras. 1) Determination of a dose that exceeds the limits specified in 10 CFR 835, Subpart C, Occupational Radiation Protection (for onsite exposure) 2) A single occupational exposure that exceeds an expected exposure by 100 mrem. 3) A single unplanned exposure onsite to a minor or member of the public that exceeds 50 mrem.	Unusual Occurrence Off-Normal Off-Normal
	Identification of radioactive contamination onsite that is not located within a Controlled Area, Fixed Contamination Area, or Soil Contamination Area, and is in excess of two times the total contamination levels in 10 CFR 835, Occupational Radiation Protection, Appendix D.	Off-Normal
	Discovery of major amounts of radioactive contamination (i.e., requires more than 8 field man hours to remediate) Note: Requires stopping work activities in the affected area	Unusual Occurrence
	During excavation activities, detection of evenly distributed contamination with detection readings greater than 500,000 dpm/probe beta/gamma, or greater than 200 dpm/probe above background alpha. Note: Requires stop work per Radioactive Air Emissions Notice of Construction.	Unusual Occurrence
	Radiological events that require reporting to other federal, state, or local agencies that would not otherwise be reportable under this plan.	Off-Normal
Defects in ITS SSC, including defects in design, manufacture, fabrication, installation, etc of SSCs	Defects that if left uncorrected could have resulted in a substantial safety hazard (i.e., the defect could have prevented the function of a hazard control strategy or initiated an accident. Note: Per the QA Manual, procurement documents shall specify the purchaser's requirements for the supplier's reporting of nonconformances and the purchaser approval of the disposition of nonconformances.	Off-Normal
Potential concerns/issues	Identification of potential concerns that are deemed worthy of reporting by the PM or designee.	Off-Normal or Unusual Occurrence (discretionary)

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Following a reportable occurrence, the PM or designee will initiate the collection of information pertaining to the event. Collection of data will be conducted with the assistance of the Responsible Manager or other individuals deemed necessary.

A graded approach will determine the level of effort required to investigate the cause of an occurrence. The graded approach is based on the severity or risk associated with the event. Using the graded approach, all occurrences must have some degree of investigation. The investigation can take the form of a meeting with involved individuals, a single person gathering information, or a Root Cause Analysis Team trained in accident investigation techniques conducting a formal investigation.

Reportable occurrences are considered Conditions Adverse to Quality as defined in the Quality Assurance Manual. Reportable occurrence investigations (including the identification of causes and appropriate corrective actions) and report initiation, review, and approval will be performed in accordance with the project Corrective Action procedure. The project Corrective Action Management System (CAMS) will be used to ensure corrective actions identified are tracked and implemented. Conditions Adverse to Quality, as documented on a Deficiency Report, will be reviewed for reporting requirements specified in this Construction Occurrence Reporting Plan.

The project Price Anderson Amendments Act (PAAA) Coordinator will be notified of reportable occurrences as soon as practical and within two hours for Unusual Occurrences to ensure PAAA requirements are met.

Disposition: The initial response provided by the contractor was determined to be inadequate for the following reasons:

- There was no commitment to make reports to the OSR as required by DOE/RL-96-0003, *DOE Process for Radiological, Nuclear, and Process Safety Regulation of the RPP Waste Treatment Plant Contractor*, Paragraph 4.5.2, item 4.
- The proposed response did not adequately ensure that subcontractors report construction occurrences in accordance with the Construction Occurrence Reporting Plan.
- Information provided in the response was based on DOE M 232.1-1A, "Occurrence Reporting and Processing of Operations Information." However, the information was not appropriately tailored to the limited construction phase activities. In addition, the response was inconsistent with the Safety Requirements Document requirements and terminology, and did not refer correctly to the ORP and BNI organizations.

This information was communicated to the Contractor in a letter dated July 23, 2001.

The Contractor addressed the above concerns in a letter dated July 26, 2001, which submitted a Construction Occurrence Reporting Plan for Limited Construction (supplemental response). The reviewers evaluated the plan and found it acceptable. See Section 3.3.2 of the LCAR SER for a detailed review.

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Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-002-Q	**Date Opened: 6/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: K. Chen**

Description:

Review Guidance: Section 2.3.3, Regulatory Acceptance Criteria, of the review guidance requires the description of the excavation-related design of important-to-safety buildings with sufficient information to ensure that the excavation will be adequate. This information includes soil compaction criteria.

LCAR Reference: Section 1.3.1.2.5, Soil Compaction Testing, of the LCAR states that one of the standards used for soil compaction testing is ASTM D2922, titled as "Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)".

Question: Standard ASTM D2922 is one of the implementing standards listed in Safety Criterion 4.1-2 of the Safety Requirements Document (SRD). However, the title for ASTM D2922 in the SRD is "Standards Test Method for Laboratory Determination of Moisture Content of Soil". What is the correct standard and title?

Contractor Response: The LCAR title for ASTM D2922 is correct. The SRD will be updated to reflect the correct title.

Disposition: The BNI response clarifies the correct title for the standard referenced in the review question. The BNI response is acceptable.

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-003-Q	**Date Opened: 6/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: K. Chen**

Description:

Review Guidance: Section 2.3.3, Regulatory Acceptance Criteria, of the review guidance requires the description of the excavation-related design of important-to-safety buildings with sufficient information to ensure that the excavation will be adequate. This information includes the demonstration that soil bearing capacity will be sufficient to support buildings.

LCAR Reference: Section 1.4, Potential for Design Changes, of the LCAR states that the BNI geotechnical investigation report confirms that the site soil conditions have adequate capacity to support these building loads without significant deflections and indicates that the soil is capable of sustaining significantly greater bearing loads than those estimated. When the final seismic analysis is completed, estimated soil loads will be replaced by calculated loads and confirmed to be acceptable.

Question: What is the scope of the final seismic analysis discussed above? Will future construction activities, beyond those as described in the current LCAR, be performed before completion of the final seismic analysis?

Contractor Response: The seismic analysis scope will include those activities described in the "Seismic Analysis and Design Approach," RPT-W375-RU00005. This analysis will provide loads used to determine building loads imposed on the soil.

No, there are no permanent structures being constructed during the LCAR scope. The mud mat is not a structure, but a cap over the soil to provide a construction work surface and protect the compacted soil.

Disposition: The BNI response addresses the scope of the seismic analysis, which was raised in the review question. The BNI response is acceptable.

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-004-Q	**Date Opened: 6/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: K. Chen**

Description:

Review Guidance: Section D of the review guidance, requires that the information on the design and installation of mud mats for the process buildings be provided.

LCAR Reference: Section 1.3.1.3, Mud Mat Placement, of the LCAR states that the acceptability of the mud mat material is confirmed through testing to ensure that backfill requirements are met.

Question: What are the testing requirements for the mud mat?

Contractor Response: Unconfined compressive tests in accordance with the technical specification for structural backfill will be performed to confirm minimum strength. This is a standard ASTM test performed on cementitious products. Although not structural concrete, and not subject to the requirements of ACI 318, the mud mat is a concrete material that will be tested to confirm minimum strength.

Disposition: The BNI response states that the testing requirements for the placement of the mudmat will be based on the requirement specified in ASTM C39, which is referenced in ACI 318 for compressive strength tests for cementitious products like the mudmat. The BNI response is acceptable.

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Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-005-Q	**Date Opened: 6/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: R. Garrison**

Description:

Review Guidance: Section D items 2 and 15.

…BNI should provide a complete description of all LCAR activities for which authorization is requested. This description should include the following:

2. Temporary facilities and services installed under the LCA; drawings may be included or referenced.
15. Design, design change, and modification processes for activities performed during the LCA.

LCAR Reference: Section 1.3.2.1 p7, section 1.3.3.7 p11, and section 1.4 p13.

1.3.2.1…Utility trenches will be excavated to allow installation of pipelines shown… Portions of the permanent electrical duct bank system shown…will also be installed to the extent practical to facilitate expediting the construction schedule. No ITS duct banks will be installed

1.3.3.7…No permanent power cables will be installed during limited construction. Construction power will be routed in temporary concrete-encased duct banks, spare conduits in permanent non-ITS duct banks, and by overhead power distribution lines around the perimeter of the storage and laydown areas as shown…

1.4…The most likely source of changes initiated within the project would result from ongoing redesign…Installations that are scheduled to be completed during limited construction that could be impacted by these ongoing design activities are as follows:

- Primary Facility Excavations
- Permanent Underground Utilities

Question: It is likely that during the lifecycle of the facility, the location of abandoned in place temporary components will be required for completion of facility modifications. How will temporary installations that will be abandoned in place, be documented sufficiently to prevent interferences with future installations? Are temporary installations that will be abandoned in place included in the baseline design, or will they be added by change notice at the time of abandonment?

Contractor Response: Construction will document the location of all underground facilities and utilities. A guide will be developed describing how U/G items will be documented. This guide is scheduled to be completed prior to commencing limited construction activities.

Temporary installations that are abandoned in place will be shown on the applicable project drawings after information is provided by construction. Abandoned installations will not be considered part of the baseline design.

Disposition: The reviewer's concern pertained to the potential for undocumented abandoned-in-place temporary installations interfering with important-to-safety installations at a later date. Contractor's response indicated that abandoned-in-place temporary installations would be shown on the applicable project drawings and as such this information will be available for consideration in any future changes to the facility. The response addresses the concern and is acceptable.

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-006-Q	**Date Opened: 6/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: Y. Gibbons/M. Black**

Description:

Review Guidance: Section 2.3.3, Regulatory Acceptance Criteria, of the review guidance requires the description of the excavation-related design of important-to-safety buildings with sufficient information to ensure that the excavation will be adequate.

LCAR Reference: Section 1.3.1.2.1, of the LCAR states that a geotechnical engineer will monitor excavation process, inspect the in-situ soil to confirm that sub-grade conditions are consistent v the data contained in the Geotechnical Investigation Report.

Question: What are the required qualifications for the geotechnical engineer monitoring the excavation? How will the geotechnical engineer document that the sub-grade soil conditions are consistent with the data contained in the Geotechnical Investigation Report?

Contractor Response: The geotechnical engineer will be a Bechtel staff engineer proficient in the area of geotechnical assessment of soils. Inspection of the excavated surface by this individual is required prior to placement of the mud mat.

Written notification of this review and acceptability or remediation requirements will be provided in writing to the subcontractor and project file.

Disposition: The BNI response states that the geotechnical engineer monitoring the excavation activity will be an experienced Bechtel staff engineer proficient in excavation activity. In addition, the excavation activity will be documented and filed. The BNI response is acceptable.

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Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	OSR Review Team Preliminary Questions for BNI
Question #: 01-LCAR-007-Q	**Date Opened: 6/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: R. Gilbert**

Description:

Review Guidance: Section E.1.3.3 states "BNI provides an event logic network showing the limited construction critical path activities."

LCAR Reference: The LCAR transmittal letter states "Current baseline schedules including activities within the scope of this LCAR are provided in Attachment 3." Attachment 3 provides a Level 3 schedule of procurement and construction activities from October 2001 through August 2007. Predecessor and successor activities are identified; however, critical path and logic are not clearly identified.

Question: What is the critical path through construction authorization, and the logic for the critical path activities? What are the project impacts associated with delaying proposed LCAR activities? Why are specific activities defined in the LCAR required before construction authorization?

Contractor Response: The critical path and required LCAR activities through construction authorization (placing initial concrete on 11/4/02) is shown on the attached limited construction schedule summary chart and associated event logic network. A detailed event logic network and level III LCAR schedule are also attached. LCAR activities 1 through 5 and 26 are precursors required to support concrete placement per the baseline schedule. Delaying these activities would result in delaying the start of concrete placement and subsequent milestones including hot commissioning in 2007. Temporary construction facilities and services included on the schedule are required to support construction activities. Portions of the permanent underground utilities will be used to support construction activities and are included in the LCAR to improve efficiency and reduce cost. The portion of the permanent ground grid included in the LCAR (activity 0007) is associated with the perimeter fence. The perimeter fence requires grounding for personnel protection during limited construction and installing portions of the permanent grounding to accomplish this is prudent and cost effective. Construction of the administration building (activity 0014) is included in the LCAR as a contingency in support of efficient use of resources during limited construction. Inclusion of the administration building presents a potential cost saving. It has been determined that pre-assembly of stainless steel liners during limited construction is not required. The LCAR will be updated to remove this activity (see response to question # 25).

Disposition: The response was acceptable to the reviewers. The Contractor provided an event logic network that related proposed limited construction activities to follow-on construction work. The limited construction work proposed is necessary to achieve key project milestones such as start of construction of primary process facilities and start of hot operations. Certain activities, such as construction of the administration building, were justified as efficient use of resources during limited construction with potential project cost savings.

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-008-Q	**Date Opened: 6/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/19/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: R. Gilbert**

Description:

Review Guidance: Section D states the description of activities in the LCAR for which authorization is requested should provide "Discussion of the potential for design changes that may require rework of installations scheduled to be completed during limited construction activities."

LCAR Reference: Section 1.4 describes the potential for design changes including the most likely source, redesign of the pretreatment facility. This section states changes will be captured in the project change management process. After approval of the LCAR, required authorization basis changes will be processed according to RL/REG-97-13, Regulatory Unit Position on Contractor-Initiated Changes to the Authorization Basis.

Question: What is the planned sequence and timing for resolving the potential redesign of the pretreatment, LAW pretreatment, and analytical laboratory portions of the facility? When will associated Authorization Basis Change Requests be submitted? How will changes to the activities planned during limited construction be reviewed by BNI and provided to OSR to assess the impact to the authorization basis?

Contractor Response:

PT Redesign

The PT redesign being developed is anticipated to result in the consolidation of PT and LPP functions into one building with a separate laboratory building.

The Design Change Application (DCA) for this new configuration is scheduled to be issued by late July 2001. The DCA process requires an Authorization Basis (AB) impact review and the initiation of an ABCN prior to DCA approval. It is not expected that this ABCN will require prior OSR approval per the requirements of RL/REG-97-13.

Although the LCAR will not be an AB document until DOE approval, it is being included in AB reviews to ensure it is consistent with the facility design and project plans, programs, and procedures (per project memorandum CCN 020705, dated 6/14/01).

The LCAR text will be revised consistent with the PT redesign DCA and transmitted in parallel with the ABCN. If the LCAR is approved (becomes AB) prior to implementation, and ABCN will be processed to change the LCAR. It is expected that the ABCN and LCAR revision will be transmitted by mid to late August 2001.

Construction excavation drawings for the redesigned PT building are expected to be available mid to late September 2001.

The Construction excavation drawings for the Analytical Laboratory building associated with the PT redesign are expected to be available late October 2001.

Layout Change

The facility layout is being changed to relocate structures to provide more efficient use of space and to improve operational aspects of the layout. The layout change does not alter the relative locations of the HLW, LAW, and PT buildings. The new layout provides sufficient space to accommodate PT redesign options being considered, including the baseline PT/LPP design. The area of the layout reserved for the PT/Laboratory building will be "on hold". The layout will be updated when the PT redesign is completed and approved to reflect the final PT/Laboratory design.

The layout change is not expected to require changes to the LCAR text. However, the AB impact review for this change will include the LCAR to ensure no changes are required. The revised layout drawing is expected to be completed by July 18, 2001. It is expected that the updated layout drawing and updated Issued for Bid (IFB) Underground Utility drawings referred to in the LCAR will be forwarded to OSR by mid to late July 2001.

Disposition: The Contractor's response was acceptable. The Contractor provided current plans for making changes to the design associated with limited construction and described the overall process they will use. The Contractor will evaluate impacts to the authorization basis for the changes, submit required ABCNs, and provide revised design information to the OSR.

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-009-Q	**Date Opened: 6/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: F. Han**

Description:

Review Guidance: Section 2.3.3, Regulatory Acceptance Criteria, of the review guidance states the footprints and elevation of the compacted sub-grades for buildings should be provided.

LCAR Reference: Appendix A of the LCAR provides related drawings for the LCAR construction activities.

Question: The elevations of building foundations are typically based on the elevation above sea level for Hanford Site facilities. The LCAR package uses grade as 0 feet elevation but does not provide the reference to the above sea level elevation. This could result in uncertainty in the true elevations of various foundations. How will true elevations be established?

Contractor Response: The WTP project has established reference elevations for each of the primary process facilities. The 0 foot elevation is a reference point for each facility. A corresponding mean sea level reference for each facility is also identified on design drawings.

The vertical datum is the North American Vertical Datum of 1988 (NAVD88).

Disposition: The BNI response states that a sea level reference for each facility will be identified in design drawings. The BNI response is acceptable.

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	OSR Review Team Preliminary Questions for BNI
Question #: 01-LCAR-010-Q	**Date Opened: 6/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: F. Han**

Description:

Review Guidance: Section 2.3.3, Regulatory Acceptance Criteria, of the review guidance requires the description of the excavation-related design of important-to-safety buildings with sufficient information to ensure that the excavation will be adequate.

LCAR Reference: Section 1.2.1, Primary Process Facilities, of the LCAR states that loads on the base mat will be distributed uniformly to the surface being excavated as part of the LCAR scope. In the same paragraph, the LCAR also states that the soil interface will be prepared to a point of readiness for structural work.

Question: What is the technical basis for the statement that loads on the base mat will be distributed uniformly to the surface being excavated? What is meant by "soil interface will be prepared to a point of readiness"?

Contractor Response: The structural system selected for the process facilities are structural mats. This system was selected for its ability to accommodate large loads with limited settlement. These mats are at least 5 feet thick. Compared to the stiffness of the soil, the mats are significantly more rigid and will distribute loads across the soils surface. Evaluations of the loadings under the mats and mat strength will be assessed as part of the structural analysis.

The soil interface is the portion of the basemat in contact with the soils or mud mat. Preparation of this material will be in accordance with the technical specification for excavation and backfill. Disturbed insitu soils will be re-compacted in accordance with the Excavation and Backfill specification. In the event that unacceptable materials are encountered in the excavation, they will be removed under the direction of the qualified geotechnical engineer and replaced with compacted fill material.

Disposition: The BNI response addresses the meaning of "soil interface will be prepared to a point of readiness". The BNI response also states that a base mat with the ability to accommodate large loads with limited settlement will be selected. Exact loadings under the mats and mat strength will be evaluated in the structural analysis. The BNI response is acceptable.

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-011-Q	**Date Opened: 6/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: F. Han**

Description:

Review Guidance: Section 2.3.3, Regulatory Acceptance Criteria, of the review guidance requires the description of the excavation-related design of important-to-safety buildings with sufficient information to ensure that the excavation will be adequate.

LCAR Reference: Section 1.3.1.2.3, Excavation, of the LCAR states that a soil retention system m be installed, extending below the elevation of the open cut excavation. These sheet piles may rem in place, as a form for the construction of the concrete walls.

Question: The deepest opening of the excavated area is in the pretreatment building (approximately 50 feet below grade). Driving sheet piles to such depth may result in potential large out-of-plumb construction. Further, after the sheet piles are installed, the soil within the surrounded sheet piles needs to be excavated. This again will result in certain deflection in the sheet piles due to soil pressures from the outside. With the construction tolerance and deflection from soil pressure, potentially large displacements of the sheet pile from its original plumbing line may occur. What impact do these deflections have on foundation and wall design?

Contractor Response: None, accommodations will be made for deformation of the soil retention system which may occur during installation or as a result of excavation activities. The minimum wall thickness will not be compromised as a result of the installation tolerances.

The technical specification for design of this system limits the deformation of the system. The size of the excavation and location of the retention system will include sufficient margin to account for deformation of the retention system to ensure the foundation and walls can be constructed to meet design specifications.

Disposition: The BNI response states that the soil retention system will have sufficient margin to account for deformation of the soil retention system. The BNI response is acceptable.

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-012-Q	**Date Opened: 6/11/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: A. Hawkins**

Description:

Review Guidance: Section 3.1.3.3, "Regulatory Acceptance Criteria," of the review guidance states, "The LCAR must commit to an approved QAP for limited construction. BNI's QAP for limited construction is acceptable if…it describes an acceptable QA program for the identified limited construction activities that can be implemented."

LCAR Reference: The LCAR uses the terms "QA Program" and "QA Manual." "QA Manual" is understood to be QAM-24590-01-00001. "QA Program" is not defined, and its definition is not clear from the BNI usage. For example, Section 3.2, "Quality Assurance," states, "The QA Program will be approved by OSR…." As submitted by BNI, OSR is reviewing the QA Manual for possible approval. This section also states, "QA Program section numbers may change due to program revisions." The sections of the QA Manual are based on the standard (NQA-1) selected by BNI, and should remain consistent.

Question: How is the term "QA Program" defined?

Contractor Response: The term QA Program will be changed to QA Manual for consistency and congruence with other project terminology.

Disposition: The Contractor's response makes the wording of the LCAR consistent with the QAM. The reviewers determined that the Contractor's response was acceptable based on previous acceptance of the QAM.

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-013-Q	**Date Opened: 6/11/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: A. Hawkins**

Description:

Review Guidance: Section 3.1.3.3, "Regulatory Acceptance Criteria," of the review guidance states, "The LCAR must commit to an approved QAP for limited construction. BNI's QAP for limited construction is acceptable if…it describes an acceptable QA program for the identified limited construction activities that can be implemented."

LCAR Reference: Section 3.4.1 of the LCAR states, "Grading will be accomplished through application of varying depth, methods, and responsibility for inspection activities as appropriate to the importance of the item or activity." The QA Manual (Policy Q-02.1) describes a grading process that considers a number of risk factors that do not include "…depth, methods, and responsibility for inspection activities."

Question: What process will be used to define the scope, depth, and rigor of the application of QA requirements (grading)?

Contractor Response: The process described in QAM section Q2.1 will be utilized to establish the scope, depth and rigor of the application of QA requirements. Results of the evaluation (and therefore the approach for grading) will be communicated by Engineering to Construction via specification or design drawing. LCAR Section 3.4.1 will be updated to reflect this response.

Disposition: The Contractor proposes to use the graded approach defined in the QAM. A separate review of the QAM found this approach to be acceptable. Therefore, the reviewers determined that the Contractor's response was acceptable.

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-014-Q	**Date Opened: 6/12/01**
Place "X" if answering "yes": Protection Information? ___ Proprietary Information? ___ Team Accepted? _X_	**Date to Contractor: 6/19/01** **Date of Response: 7/3/01** **Date Closed: 8/9/01** **Reviewer: A. Hawkins**

Description:

Review Guidance: Section 3.1.3.3, "Regulatory Acceptance Criteria," of the review guidance states, "The LCAR must commit to an approved QAP for limited construction. BNI's QAP for limited construction is acceptable if…it describes an acceptable QA program for the identified limited construction activities that can be implemented."

LCAR Reference: The QA Manual requires (Q-15.1, "Control of Nonconforming Items"), "Nonconforming items that are subsequently re-worked, repaired, or replaced are to be inspected and/or tested to either the original requirements or to specified alternative requirements." The LCAR requires (Section 3.4.1, "Nonconforming Items"), "Reworked and repaired items will be inspected, tested, or reviewed in accordance with original requirements or approved alternate requirements, respectively."

Question: What is the approval process for alternate requirements?

Contractor Response: LCAR Section 3.4.1 will be updated to use the term "specified" consistent with the QA Manual.

Disposition: The Contractor's response makes the wording of the LCAR consistent with the QAM. The reviewers determined that the Contractor's response was acceptable based on previous acceptance of the QAM.

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-015-Q	**Date Opened: 6/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: A. Hawkins**

Description:

Review Guidance: Section 3.1.3.3, "Regulatory Acceptance Criteria," of the review guidance states, "The LCAR must commit to an approved QAP for limited construction. BNI's QAP for limited construction is acceptable if…it describes an acceptable QA program for the identified limited construction activities that can be implemented."

LCAR Reference: Section 1.3.3.3 of the LCAR states, "A materials testing laboratory and office will be located within the concrete operations area for ready access to concrete production activities. The materials testing laboratory and office is not an ITS SSC. However, the laboratory will perform ITS testing of soils during limited construction as described in Section 1.3.1.2.5." (Note also that Section 1.3.1.3 of the LCAR states: "The installation of the mud mats is not an Important-to-safety activity. However, inspection of the mud mats is quality related and is part of the authorization basis.)

Question: To what extent will the materials testing laboratory service: (a) be evaluated and qualified by BNI before use and (b) follow the approved quality program?

Contractor Response: The materials testing laboratory subcontractor is required to provide a Quality Assurance plan. The testing laboratory's QA plan is required to comply with the applicable sections of NQA-1 identified in the Material Testing Services technical specification. BNI QA will review this program and monitor implementation of the vendor's plan.

Note: Section 1.3.1.3 of the BNI LCAR does not include the statement cited by the reviewer.

Disposition: The commitment made by the Contractor is consistent with the requirements of the QAM and adequately addresses the QA requirements applied to the materials testing laboratory. The reviewer's comment included a typo. The reference to LCAR section "1.3.1.3" should have been "1.3.3.3." The reviewers determined that the Contractor's response was acceptable.

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	OSR Review Team Preliminary Questions for BNI
Question #: 01-LCAR-016-Q	**Date Opened: 6/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: A. Hawkins**

Description:

Review Guidance: Section 3.1.3.3, "Regulatory Acceptance Criteria," of the review guidance states, "The LCAR must commit to an approved QAP for limited construction. BNI's QAP for limited construction is acceptable if…it describes an acceptable QA program for the identified limited construction activities that can be implemented."

LCAR Reference: The sub-section entitled "Subcontract Administration" within Section 3.4.1 states: "Subcontractors performing important-to-safety activities are required to have an approved quality program appropriate to the work, or will work directly to the WTP QA Program.

- If implementing an approved subcontractor quality program, activities will be verified to be in compliance with contract quality requirements by Quality Assurance or Quality Control through audit, surveillance, and document review, as appropriate.

- If working to the WTP QA Program, activities will be performed to the appropriate construction procedures with monitoring and inspection by Field Engineering and Quality Control as specified therein."

The BNI QA program does not describe any difference in the oversight provided for subcontractors working to their own QA program and those working to the BNI QA program.

Question: Why would important-to-safety activities performed by subcontractors who work to the WTP QA Program not also be subject to "audit, surveillance, and document review, as appropriate" in addition to monitoring and inspection?

Contractor Response: Subcontractors will be subject to "audit, surveillance, document review, as appropriate" as described in the QA manual. The subject section is not intended to exclude these activities, but is focussed on responsibilities of the field Construction organization and does not include activities being performed by the QA organization.

Disposition: The Contractor clarified its intent to apply the same oversight to subcontractors working to their own QA programs and subcontractors working to the Contractor's AQ program. This is consistent with the QAM. The reviewers determined that the Contractor's response was acceptable.

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for the Contractor**
Question #: 01-LCAR-017-Q	**Date Opened: 6/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: N. Kaushal**

Description:

Review Guidance: Section E 2.33 Regulatory Acceptance Criteria states in part "… submittal is acceptable if it sufficiently describes … bases for any work activities in the LCA scope that are considered important-to-safety."

*LCAR Reference***:** Section 1.3.3.2 states " the batch plant … will utilize qualification testing to establish its ability to produce consistent quality concrete."

Question: What facilities will be used for this concrete qualification testing?

Contractor Response: The same subcontractor that performs the soil testing will perform the concrete qualification testing. The tests may be performed at the onsite materials testing laboratory or may be performed at offsite facilities. The testing subcontractor will perform these tests under the approved QA plan.

Disposition: Qualification of the concrete batch plant was stated by the Contractor to be one of the activities in the scope of the LCAR. However, the Contractor did not identify in the LCAR what facility would be used for concrete qualification testing. Contractor's response indicated that the specific facility for carrying out concrete testing had not been identified but that the work will be performed by a subcontractor under the approved QA program. Inasmuch as the approved QA program would include appropriate standards for concrete qualification testing, this response is acceptable.

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for the Contractor**
Question #: 01-LCAR-018-Q	**Date Opened: 6/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: N. Kaushal**

Description:

Review Guidance: Section E 2.3.3-Regulatory Acceptance Criteria, first paragraph, states that "BNI should identify and describe the following important-to-safety features as they apply to the LCAR submittal."

Per item 8 of the same section, "capability of the civil testing laboratory to **repeatedly and reliably** perform tests to verify that important-to-safety attributes … conform to the design requirements" (emphasis added).

LCAR Reference: Section 1.3.3.3-Materials Testing Laboratory and Office, provides a short statement about the materials testing laboratory.

Question: How will the capability of the materials testing laboratory be established to "repeatedly and reliably" perform tests?

Contractor Response: As stated in LCAR Section 1.3.1.2.5, "Application of ASTM D3740 will ensure the capability of the civil testing laboratory to repeatedly and reliably perform tests to verify that important-to-safety attributes, such as soil density and compaction and moisture content, conform to design requirements."

Material testing will be performed in accordance with an approved QA plan and BNI QA will monitor subcontractor compliance with his approved QA plan.

Disposition: The reviewer's concern centered on potential use of the Materials Testing Laboratory for concrete testing for qualification of the batch plant and the standard to be used for this purpose. Contractor addressed that concern in response to 01-LCAR-017-Q by stating that this work would be performed by a subcontractor under the approved QA program. Response to this question (01-LCAR-018-Q) restates Contractor's commitment to apply ASTM D3740 for soil testing activities and is acceptable in view of response to 01-LCAR-017-Q.

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	OSR Review Team Preliminary Questions for BNI
Question #: 01-LCAR-019-Q	**Date Opened: 06/11/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: J. Polehn**

Description:

Review Guidance: Section 6.0, Radiation Protection Program, of the review guidance requires the submittal to adequately reference and commit to an approved Radiation Protection Program (RPP). The RPP, Rev. 7 (Section 6) refers to a Radiological Control Program.

LCAR Reference: Section 4.1 [Radiation Protection Program for Construction], last sentence, "SRD Safety Criteria 5.0-1 and 1.0-10 and ISMP Section 2.3 are applicable to the RPP for Design and Construction." SRD SC 5.0-1 states, "The RPP-WTP Radiological Controls Program shall address all items in 10 CFR 835 and the additional Safety Criteria provided in SRD Volume II Sections 5.1 and 5.2." In Attachment 2 of the LCAR, Comment/Question # 00-LCAR-021-Q, the response states, "The RCP has been cancelled." The two LCAR statements are inconsistent.

Question: How will BNI comply with SRD SC 5.0-1?

Contractor Response: SRD Safety Criterion 5.0-1 states:

"A Radiation Protection Program (RPP) compliant with 10 CFR 835 shall be developed and submitted for approval to DOE.

The River Protection Project - Waste Treatment Plant (WTP) Radiological Controls Program shall address all items in 10 CFR 835 and the additional Safety Criteria provided in SRD Volume II, Section 5.1 and 5.2."

Bechtel National, Inc. (BNI) has submitted a 10 CFR 835 compliant RPP which has been approved by DOE (01-OSR-0123). BNI is currently in the DOE authorized implementation period of the approved RPP. The Radiological Controls Program being put in place will be fully compliant with Safety Criterion 5.1 and 5.2 upon completion of the implementation period. It should be noted that ABCN-24590-01-00005 is currently being processed for submission to the DOE. This ABCN corrects the conflicts with safety criterion 5.1 and the DOE approved RPP. Further, Safety criterion 5.2 contains no requirements.

The "RCP" being referred to in the response to question 00-LCAR-023-Q on the original BNFL LCAR submittal is referring to a manual that has been cancelled. The Radiological Controls Program referred to Safety Criterion 5.0-1 is the actual radiological program currently being implemented in the WTP.

Disposition: The reviewers asked for clarification for the following inconsistency (01-LCAR-019-Q). LCAR Section 4.1, indicated there would be a Radiological Control Program (SRD Safety Criteria 5.0-1) and in LCAR Attachment 2, the Contractor response to 00-LCAR-021-Q, the Contractor stated the RCP had been cancelled. The Contractor's response to the OSR identified inconsistency specified, "The "RCP" being referred to in the response to 00-LCAR-023-Q on the original BNFL LCAR submittal is referring to a manual that has been cancelled. The Radiological Controls Program referred to Safety Criterion 5.0-1 is the actual radiological program currently being supplemented in the WTP." Though not literally stated by the Contractor response, the Contractor's staff communicated that the RCP that was cancelled was the companion document to Revision 4 of the RPP. The BNFL Contractor withdrew this RPP and thus the companion RCP was cancelled. The response was adequate because the Contractor communicated that there would be an RCP.

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-020-Q	**Date Opened: 06/12/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01 and 7/19/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: J. Polehn**

Description:

Review Guidance; Section D, Information Required in the LCAR, item 16, "BNI should provide a complete description of all LCAR activities for which authorization is requested. This description should include the following:….16. Results of pre-LCA radiological surveys and radiological sampling."

LCAR Reference: Attachment 5, LCAR-Review Guidance matrix, specifies that LCAR Review Guidance item D.16 is addressed by LCAR Section 4.2. Section 4.2, Radioactive Contamination Detected During Construction states, "BNI does not intend to perform additional site characterization and will establish a monitoring program initially based on the characterization specified in HNF-2067." HNF-2067 contains data obtained prior to disturbance of the site.

Question: What specific plans does BNI have for radiological surveys and sampling during limited construction? What radiological surveys and sampling did CH2MHill, or other contractors, conduct during site clearing and infrastructure work and what were the results?

Contractor Response: The DOE does not have the WTP construction site under radiological control. The site is currently being managed by DOE/others without any radiological posting. DOE has provided no information that would indicate the construction site is an unplanned release site. BNI has reviewed TWRS Phase I Privatization Site Pre-Construction Characterization Report, HNF-2067, and concluded that no additional site characterization is necessary.

After implementation of the RPP, BNI intends to conduct an initial site survey in an effort to identify any environmentally transported legacy contamination. The survey will concentrate in high probability areas such as along the site boundary facing the Tank Farms and areas identified in HNF-2067 that contain slightly elevated background levels. All minor (can be remediated in less than eight hours) amounts of radioactive material will be collected, packaged, and properly stored for DOE disposition. If significant amounts (requires more than eight hours to remediate) of radioactive material are discovered, the area will be posted, work activities in that area will be stopped, and DOE will be notified.

After completion of the initial survey, periodic confirmatory surveys will be performed. The survey frequency will be determined by the amount of radioactivity detected, with a target period of quarterly. This survey frequency will be augmented by surveying after sustained high winds and surveying the spoil piles after extensive excavation.

Verification of radiation exposure will be performed by establishing an area dosimetry program between the potential source of radiation (Tank Farms) and the WTP construction site.

Radiological surveys were performed by Fluor Hanford during the execution of project W519. The excavations performed for this work did not identify any contaminated soil and only non-contaminated soil was used for the excavation back fills. The only radioactivity detected was from deep rooted vegetation growing over a failed transfer line. This location is not on the WTP construction site and Fluor Hanford removed the contaminated vegetation and treated the area with herbicide to prevent future growth. Note: The radiological information from the W519 project was provided verbally by Fluor Hanford radiological control. Fluor Hanford is not obligated to submit to an assessment request from BNI or recover and produce records for a contractor of which they are not under contract.

Question 01-LCAR-020 (Supplemental)

Contractor Response:

The purpose of this supplemental information is to document phone discussions between Bechtel National, Inc. (BNI) (S. M. Henry) and the U.S. Department of Energy, Office of Safety Regulation (OSR) (J. L. Polehn). These discussions clarified what allows survey frequency to be adjusted, what constitutes "sustained high winds, and what is intended by "extensive excavation".

The Office of River Protection - Waste Treatment Plant (WTP) construction site is not a radiological area, does not contain radiological postings, and therefore has no periodic radiological survey requirements. However, a review of recent occurrence reports would indicate that some level of radioactivity is transferred uncontrolled around the Hanford site by environmental and biological vectors. It is, therefore prudent to monitor the construction site for radioactivity deposited by these vectors. The quarterly frequency was selected since WTP Radiological Control Manual (WTP RCM) article 551.12 requires "Monitoring data in each building or area should be compiled and reviewed at least quarterly. Changes or trends should be noted and corrective actions assigned." Further, article 551.8 requires "Survey frequencies should be established based on potential radiological conditions, probability of change in conditions and area occupancy factors." These two requirements drive the maximum survey frequency to quarterly since the area is not posted and past surveys have found no contamination. Should the survey indicate radioactivity is routinely detected (the number of contamination events is more significant than the specific contamination level of each event) or a condition changes, such as high level radiological work performed by another contractor adjacent to the WTP construction site, these requirements would increase the survey periodicity to a frequency commensurate with the risk and good health physic practices.

Surveys will also be conducted after periods of sustained high winds. This is intended to mean that during environmental conditions that transport a distinguishable accumulation of dead, deep rooted vegetation on the WTP construction site, additional radiological surveys of the vegetation and if radioactivity is detected, the transport path across the construction site will be performed.

In addition to the biological and environmental transport vectors, the remote possibility exists that unidentified radioactive discharges were previously conducted at the location now being used to construct the WTP. Because of this, surveys of the spoil pile will be surveyed after an excavation depth of approximately 15 - 20 feet or if excavation is stopped due to the discovery of unexpected buried debris or material.

Question 01-LCAR-020 (Supplemental)

The OSR requested confirmation of specific details of the BNI radiological survey and sampling plan during limited construction. The points requiring confirmation were the performance of daily radiological surveys, identification of a documented process to evaluate survey frequency, and the definition of major contamination.

Radiological surveys of the construction site will be performed at a frequency to ascertain radiological conditions. The initial radiological survey is performed to confirm radiological conditions of the construction site. In this case, the site is not under radiological control and is not posted as a radiological area. Therefore, upon the conclusion of the initial survey, the site will be released for work as a non-contaminated work area or it will be placed under radiological control. Subsequent surveys will be performed as a method to confirm that radiological conditions have not changed, with the frequency based on the amount of earth moved. If significant excavation occurs as expected at the initial stages of construction, then surveys will take place daily. Survey frequency will be adjusted as the survey results indicate.

The requirements and considerations for establishing and modifying a radiological survey frequency are described in the River Protection Project - Waste Treatment Plant Radiological Control Manual, article 551.

The definition of major amounts of radioactive material was not intended to require two radiological control technicians (RCT) for eight hours of remediation. Although BNI intends to have two qualified RCTs available to support construction activities, no commitment is made to have both RCTs working full time, simultaneously, at the construction site. If the detected contamination requires one RCT more than eight hours to verify the boundaries and remediate, the area will be posted, work activities in that area stopped, and the U. S. Department of Energy, Office of Safety Regulation notified.

Disposition: The reviewers asked for clarification (01-LCAR-020-Q) concerning radiological surveys and sampling during limited construction because the LCAR Section 4.2 provided insufficient detail. The Contractor's initial response indicated an initial survey would be performed to identify any environmentally transported legacy contamination. After completion of the initial survey, periodic confirmatory surveys would be performed and the survey concentrate in areas where there is a high probability of contamination (e.g., the site boundary facing the Tank Farms). The survey frequency would be augmented by surveys after sustained high winds and surveying spoil piles after extensive excavation. The Contractor further defined "sustained high winds" as those that transport dead vegetation and "extensive excavation" as excavation depths of 15 - 20 feet. In addition, the Contractor stated, "All minor (can be remediated in less than eight hours by one RCT) amounts of radioactive material will be collected packaged, and properly stored for DOE disposition. If significant amounts (requires more than eight hours to remediate) of radioactive material are discovered, the area will be posted, work activities in that area will be stopped, and DOE will be notified." In additional responses, the Contractor further clarified the content and frequency of "periodic confirmatory surveys" and "minor" and "major" amounts of radioactive materials and associated remediation. The responses were adequate because they provided information that specified the frequency of surveys and the level of remediation intended by the Contractor.

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-021-Q	**Date Opened: 06/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01 and 7/19/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: J. Polehn**

Description:

Review Guidance: Section 3.2.3.3.1, Regulatory Acceptance Criteria, of the review guidance requires BNI to develop and commit to a suitable standard for incident reporting and investigation for limited construction that is consistent with the requirements of Section 3.2.3.2.

Section 3.2.3.2, Regulatory and Contractual Requirements, of the review guidance states, "Additional relevant requirements are included in the SRD, Section 7.7, "Reporting and Incident Investigation," specifically SRD Safety Criterion 7.7-1 through 7.7-9. The description of BNI's incident reporting and investigation standard and implementing program should reflect implementation of the SRD criteria in a manner appropriately tailored to the limited construction phase."

LCAR Reference: Attachment 5, LCAR-Review Guidance Matrix, identifies that the elements of the LCAR Review Guidance for Incident investigations are addressed in LCAR Section 5. Section 5 states, "Radioactive materials will not be required to perform limited construction." That section also states, "…incident investigation requirements contained in SRD Safety Criteria 7.7-1, 7.7-2, and 7.7-3 are not applicable to limited construction activities. Incident investigation procedures will be developed consistent with DOE Manual 232.1-1A, Section 5.5, for use during limited construction activities."

Question: During the OSR/BNI meeting of June 12, 2001, BNI indicated that there was the potential to utilize radiographic sources (i.e., radioactive materials) during limited construction activities. Since major accidents (e.g., death, over-exposures, etc.) can occur involving use of radiographic sources, what will be the Notification, Categorization and Consequence Assessment process for an incident investigation with radioactive materials (e.g., radiographic sources) used during limited construction and why does SRD SC 7.7-1 through 3 not apply to limited construction activities?

Contractor Response:

Radiation exposure incidents are included in the occurrence reporting procedure described in response to question 01-LCAR-001-Q.

The statement in the LCAR relative to no radioactive materials onsite during limited construction was in reference to radioactive materials that could result in the occurrence of a "major accident" as defined in ISMP Section 12 and 29 CFR 1910.119(m).

The reason that SRD Safety Criteria 7.7-1 through 3 are not applicable during limited construction is as stated in LCAR Section 5:

> "As described in SRD Safety Criterion 7.7-1 and DOE/RL-96-0006 incidents that result in or could reasonably have resulted in a major accident shall be investigated. Per the definitions in Section 12 of the ISMP, relative to implementation of the investigation and reporting requirements of 29 CFR 1910.119(m), a major accident is a major uncontrolled emission, fire, or explosion, involving one or more highly hazardous chemicals or radioactive materials, that presents serious danger to facility worker.
>
> During limited construction, highly hazardous chemicals described above will not be utilized and there is no reason to believe that significant amounts of hazardous chemicals were improperly disposed of on the construction site. Radioactive materials will not be required to perform limited construction. The anticipated low level legacy contamination that may be encountered during construction will be controlled as described in Section 4.1. The radiation protection program establishes a site monitoring and control process that identifies and controls radioactive contamination to a level several thousand times below the level necessary to present a serious danger to facility workers. As such, incident investigation requirements contained in SRD Safety Criteria 7.7-1, 7.7-2, and 7.7-3 are not applicable to limited construction activities. Incident investigation procedures will be developed consistent with DOE Manual 232.1-1A, Section 5.5, for use during limited construction activities."

Question 01-LCAR-021 (Supplemental)

Contractor Response:

During telephone conversations between OSR (J. Polehn) and BNI (S. M. Henry) it became apparent that the expression “radioactive materials will not be required to perform limited construction” contained in the 01-LCAR-021-Q original response is causing confusion. This supplemental information is provided to clarify the meaning of this statement.

Industrial radioactive sources such as soil density gages and radiography cameras may be used during limited construction. Use of these types of radioactive sources does not create the potential for a “major accident” as defined in Section 12 of the ISMP. Radioactive process material that could result in a “major accident” will not be present onsite during limited construction.

Disposition: The reviewers asked the Contractor to clarify (01-LCAR-021-Q) the discrepancy between the LCAR Section 5 statement, "Radioactive materials will not be required to perform limited construction" and the Contractor indication at a June 12, 2001 meeting that there was the potential to utilize radiographic sources (i.e., radioactive materials) during limited construction activities. The Contractor's responses ultimately indicated, "Industrial radioactive sources such as soil density gages and radiography cameras may be used during limited construction. Radioactive process material that could result in a "major accident" will not be present onsite during limited construction." The responses were adequate because LCAR activities to be performed were specified.

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Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	OSR Review Team Preliminary Questions for BNI
Question #: 01-LCAR-022-Q	**Date Opened: 6/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: K. Scown**

Description:

Review Guidance: Section 2.3.3.4 Regulatory Acceptance Criteria, requires "The excavation of the fire protection system that may be installed during LCA, including sufficient information to ensure that the installed underground portions of the system will meet seismic requirements, as well as the system performance requirements related to the excavation, if any. The submittal should include objective evidence that appropriate quality has been, or will be, applied to designing, constructing, installing, and testing the underground firewater system to meet the corresponding SRD requirements.

LCAR Reference: 1.3.2.1.1 Fire Water (Activities 0009, 0010, and 0024), paragraph 2 states "The portions of the main fire protection yard loop being installed during limited construction will provide the water source for permanent facility sprinkler systems and hose stations. These lines will be 12 inch PVC piping. The system is sized to provide sprinkler coverage to the most demanding sprinkler system (assumed to be 0.2 gpm/ft^2 for 3000 ft^2), plus 500 gpm for hose streams, at the most remote location. A hydraulic analysis will be prepared by a qualified fire protection engineer, based on the requirements of UBC and NFPA 24. As the fire protection system evolves, the size of individual sprinkler systems will be limited to ensure the capacity of the supply system is not exceeded."

Question: When will the fire water system plans, as described in NFPA 24-95 Section 1-4, be submitted for approval by the Authority Having Jurisdiction (AHJ)?

Question: Drawings in the previous LCAR submittal indicated the fire water supply main would be 14 inches. What is the basis for the 12-inch pipe size?

Question: What is the flow required for the most demanding sprinkler system?

Question: What is the bases for the assumption of 0.2 gpm/ft^2 for 3000 ft^2?

Question: What is meant by "…sprinkler systems will be limited to ensure the capacity of the supply system is not exceeded."?

Contractor Response:

1) The underground fire water piping drawings will be provided for AHJ review prior to installation. The exact date is not known at this time.

2) The 12 inch size was selected after the decision was made to change piping materials. The 12 inch PVC piping now being used actually has better hydraulic characteristics than the 14 inch HDPE piping originally identified.

3) The most demanding system has not been identified at this time. It is expected that the deluge system located in the cooling tower will be the most demanding, but this can not be verified at this time since the design for the cooling tower is not done nor has the materials of construction been confirmed.

4) This assumption is based on sprinkler systems designed to extinguish ordinary hazard type fires, which is the highest anticipated hazard in the process buildings. The largest anticipated area of the facility requiring sprinklers to be activated to contain a fire is 3,000 square feet. Additionally, it is assumed that the fire department is flowing 500 gpm hose streams while the sprinklers are activated. This provides reasonable capacity for the system without being overly conservative.

5) This means that the sprinkler system designs will be governed by the available pressures in the water supplies. The contractor will design each system to operate within the design parameters, sizing the pipes accordingly.

Disposition:

1) This response is acceptable. NFPA 24, Section 1-4, requires AHJ approval of the layout plan for a new fire service main, but does not specify when that approval is required. AHJ review and approval prior to installation of the underground firewater piping is adequate.

2) Because the 12-inch PVC has better hydraulic characteristics than the 14-inch HDPE previously identified and is acceptable per NFPA 24, Sections 7-1.1 and 10-1.2 [AWWA C900, "Polyvinyl Chloride (PVC) Pressure Pipe, 4 in. Through 12 in., for Water Distribution"], this response is acceptable.

3) Although the requirements for the most demanding sprinkler system are not yet identified, the Contractor responses to parts 4) and 5) of this question provide an adequate basis for accepting the Contractor response to this question.

4) The Contractor responded that sprinkler systems will be designed to handle/extinguish ordinary hazard type fires, which are the highest anticipated fire hazard in the process buildings. NFPA 13, Standard for the Installation of Sprinkler Systems, was reviewed and this classification appears to be reasonable. The 0.2 gpm/ft^2 for 3000 ft^2 sprinkler fire water density criterion was established to support this fire hazard classification. NFPA 13 provides sprinkler water capacity curves based on the fire hazard classification and the 0.2 gpm/ft^2 for 3000 ft^2 is above (conservative with respect to) both curves for ordinary hazard type fires. The 12-inch PVC fire water main was sized to satisfy this sprinkler criterion as well as to provide a concurrent 500 gpm for hose streams. This provides reasonable system capacity without being overly conservative.

5) The Contractor response is acceptable. It clarifies that individual sprinkler systems will be designed consistent with the hydraulic parameters associated with the fire water main (e.g., flow, pressure, etc.). The Contractor never meant to imply that the amount of sprinkler systems installed in RPP-WTP would be limited based on available water from the fire water main.

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Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-023-Q	**Date Opened: 6/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: K. Scown**

Description:

Review Guidance: Section 2.3.3.4 Regulatory Acceptance Criteria, requires "The excavation of the fire protection system that may be installed during LCA, including sufficient information to ensure that the installed underground portions of the system will meet seismic requirements, as well as the system performance requirements related to the excavation, if any. The submittal should include objective evidence that appropriate quality has been, or will be, applied to designing, constructing, installing, and testing the underground firewater system to meet the corresponding SRD requirements.

LCAR Reference: 1.3.2.1.1 Fire Water (Activities 0009, 0010, and 0024), paragraph 4, states SRD Safety Criterion 4.5-13 implementing standards are DOE-STD-1066,…DOE G-440.1,… and NFPA 801,…"

Question: What is the revision/code of record of the standards/documents that will be utilized?

Contractor Response: DOE-STD-1066-97, NFPA 801, 1995 edition, and DOE G-440.1, September 30, 1995 revision will be utilized. The revision/code of record for these documents is included in SRD SC 4.5-13 for DOE-STD-1066 and NFPA 801. SRD Appendix C, Chapter 4.0 specifies the revision of DOE G440.1.

NFPA 24 1995 Edition will be utilized.

Disposition: The response is acceptable. No further explanation is required.

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-024-Q	**Date Opened: 6/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: K. Scown**

Description:

Review Guidance: Section 2.3.3.4 Regulatory Acceptance Criteria, requires "The excavation of the fire protection system that may be installed during LCA, including sufficient information to ensure that the installed underground portions of the system will meet seismic requirements, as well as the system performance requirements related to the excavation, if any. The submittal should include objective evidence that appropriate quality has been, or will be, applied to designing, constructing, installing, and testing the underground firewater system to meet the corresponding SRD requirements.

LCAR Reference: 1.3.2.1.1 Fire Water (Activities 0009, 0010, and 0024), paragraph 3 states "The permanent portions of the fire water system installed during limited construction will be in accordance with SRD 4.5-13."

Question: NFPA 801-98, Section 4-4 Supply Mains and Hydrants, 4-4.2 requires "Each hydrant shall be equipped with a separate shutoff valve located on the branch connection to the supply main." A review of the drawings submitted with the LCAR and those identified as Issue for Bid (IFB) did not indicate there would be individual shutoff valves. Will hydrant isolation valves be provided as required by NFPA 801-98?

Contractor Response: NFPA 801-98 does not apply to this contract (see response to question 01-LCAR-023), however it is already in our plan to install the referenced isolation valves. The details of the hydrants and associated valves are shown on drawing DWG-24590 BF-C00010 included in this transmittal letter.

Disposition: The response is acceptable. First, the Contractor indicated their intent to provide the required isolation valves. Second, the Contractor provided draft drawing DWG-25490BF-C00010 which provides details on the fire water main, post indicator valves, fire hydrants, etc. The isolation valves were clearly evident on the drawing.

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	OSR Review Team Preliminary Questions for BNI
Question #: 01-LCAR-025-Q	**Date Opened: 6/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: J. Yedidia**

Description:

Review Guidance: Item 4 of Section E-1.3.3, Regulatory Acceptance Criteria, requires that there be sufficient basis for identifying and classifying any important-to-safety SSCs to be installed during limited construction.

LCAR Reference: Section 1.3.1.4, Pre-Assembly of Stainless Steel Liners, of the LCAR states "Based on ISM assessments performed to date, ---- confinement of spilled liquid as a means to reduce operating risk ---- is provided by the concrete structure itself and does not require liners. The ISM process has not identified any potential accidents that could result in damage to the structure extensive enough to negate the confinement function of the concrete structure. Therefore, the stainless steel liners are not designated as ITS."

Question: What is meant by "ISM assessments performed to date," when it is used in the LCAR? For example, what analysis including assumptions has been performed to ensure that the concrete structure, by itself, will be able to provide the confinement function against any potential spill of liquid inside the cell?

Contractor Response: It has been determined that pre-assembly of stainless steel liners during limited construction is not required. The LCAR will be updated to remove this activity. The determination that portions of the permanent fire water, potable water, and compressed air systems to be installed under the LCAR are not ITS are also based partially on "ISM assessments performed to date". The subject statement is intended to convey that these LCAR installations are not associated with any control strategies identified during ISM assessments performed up to the LCAR submittal date. Details on the progress of the ISM process were presented at the June 26, 2001 Topical Meeting.

Disposition: The reviewers consider the Contractor's response acceptable. The Contractor clarified that the conclusion that an item was not important-to-safety was reached if the item was not associated with any control strategy identified during ISM assessments performed. The Contractor's integrated safety management process including hazard anlaysis and accident analysis will be completed after initiation of limited construction and prior to construction authorization. The Contractor's determination of safety functions for the activities included as part of limited construction is preliminary. However, based on the limited safety functions associated with the proposed work; ability to correct, modify, or change the activities should additional information become available when all required work has been completed; and the opportunity to accelerate construction, the OSR concluded that this work was in the best interest of DOE.

Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-026-Q	**Date Opened: 6/14/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: J. Yedidia**

Description:

Review Guidance: Section D, item 12 of the review guidance requires a list of material types and approximate quantities that will be stored on the site and in the lay-down areas during limited construction activities, including receipt and inspection procedures for ITS SSC materials.

LCAR Reference: Not found

Question: What ITS materials will be procured and stored on the site during limited construction?

Contractor Response: The LCAR sections that address review guidance Section D, item 12 was inadvertently omitted from the review guidance matrix provided as attachment 5 to the LCAR transmittal letter. LCAR Sections 1.3.2.7 and 1.3.3.6 include information that is intended to address review guidance Section D, item 12.

Disposition: The explanation of the omission from the review guidance matrix and reference to LCAR Section 1.3.2.7 and 1.3.3.6 for review guidance Section D, item 12 was acceptable to the reviewers.

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Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-027-Q	**Date Opened: 6/19/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: N. Hunemuller**

Description:

Review Guidance: Section E.5.3.3 states, "BNI's described experience qualifications for performing limited construction work activities ensure that the activities can be performed effectively and safely."

LCAR Reference: Section 7.1 provides a list of six locations at which "Bechtel is or has recently provided construction and field services to support the DOE mission of Waste Cleanup with substantial experience in the areas of radiological safety, radiation protection, environmental radiation protection, Quality Assurance, and management controls."

Question: What specific "construction and field services" performed at the listed locations provided "substantial experience" relevant to the LCAR?

Contractor Response:

Oak Ridge-Bechtel Jacobs Role

- Overall guidance and integration of cleanup programs at the uranium enrichment facilities at Oak Ridge, Paducah, and Portsmouth
- Safe and environmentally compliant storage of uranium hexafluoride cylinders at the East Tennessee Technology Park, Paducah, and Portsmouth
- Environmental investigation and cleanup at hundreds of sites, ranging from remediation of reactor basins to deactivation of high-ranking facilities and stabilization of nuclear material Storage, consolidation, characterization, and ultimate disposal of all legacy waste and any newly generated waste
- All 29 activities were essentially completed on schedule and below cost.

Bechtel Hanford

- Decontamination and decommissioning of former weapons material production facilities
- Interim safe storage of nuclear reactors, where hazardous materials, equipment, and outer structures are removed and the reactor core is sealed within its shield walls to allow safe radioactive decay over several decades
- Cleanout of spent nuclear fuel storage basins
- Remediation of massive contaminated soil sites and disposal of excavated wastes, including design, construction, and operation of a 4-million-ton disposal facility
- Permitting, environmental compliance, groundwater remediation, waste management, and surveillance and maintenance of retired facilities and sites

Savannah River Site

- Design and construction of four facilities for tritium handling and processing, upgrades to a high-level waste tank farm, and restart of the F-canyon, FB-line, and HB-line
- Evaluation of technologies for treating spent nuclear fuels; technologies include co-disposal, melt and dilute, press and dilute, electromet-allurgy, glass material oxidation dissolution, and plasma arc melting
- Environmental restoration, including managing, integrating, and remediating over 300 waste sites and groundwater cleanup units
- Planning, design, and construction of facilities for the storage, disassembly, and conversion of excess plutonium for ultimate disposition by reactor burning or immobilization
- Five times our construction department completed over 2.5 million job-hours without a lost-time accident.

Nevada Test Site

- Stockpile stewardship, nuclear waste management, and crisis and consequence management for nuclear emergencies
- Development of new environmental technologies and emergency response capabilities
- Counter-terrorism technology development, training, and intelligence to detect activities leading to illegal weapons of mass destruction

Energys Formerly Utilized Remedial Action Program (FUSRAP)
We were responsible for site characterization, stabilization, remediation, and restoration at 46 facilities nationwide, including six high-priority Superfund sites, and over 300 vicinity properties in both residential and industrial areas. Site soils, surface water, groundwater, sediments, or sludge were contaminated with heavy metals, dioxin, cyanide, acids, PCBs, volatile organics, asbestos, or petroleum hydrocarbons, as well as uranium, radium, or thorium.

Idaho National Engineering Laboratory

- Expanding INEEL's scientific capabilities in areas such as subsurface geoscience
- Managing environmental restoration at INEEL in a safe, legally compliant manner, especially the cleanup of buried nuclear waste
- Continuing core research in nuclear reactor science and technology to develop the next generation of reactors, which are safer, more economical, and proliferation-resistant and produce less waste
- Developing new science and technology for alternative energy and energy efficiency, such as biomass derived fuels
- Sensing and diagnostics for safety and industrial processes

Disposition: The Contractor's response adequately listed the specific "construction and field services" performed at the six locations that provided "substantial experience" relevant to the LCAR.

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Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-028-Q	**Date Opened: 6/19/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: N. Kaushal**

Description:

Review Guidance: Section D, "Information Required in the LCAR," states in part "BNI should provide a complete description of LCAR activities for which authorization is requested. This description should include the following:"

Item 2 under section D states: "Temporary facilities and services installed under the LCA …"

Item 3 under section D states "Permanent facilities and services installed under the LCA …"

LCAR Reference: Activity number 11 in Table 1 is described as "Excavation for other U/G utilities – raw water, potable water, permanent power, site drainage, compressed air, cathodic protection, **etc**." (emphasis added).

Question: What U/G utilities and excavations, other than those explicitly included in the list above, are included in the LCAR scope?

Contractor Response: There are no U/G utilities and excavations included in the LCAR that are not explicitly included in LCAR Table 1. The use of "etc." in activity number 11 will be removed from the LCAR.

Disposition: The reviewer's concern pertained to use of the word "etc." which implied that activities other than those specifically identified in the LCAR were also contemplated. The Contractor's response clarified that no other activities were contemplated and the Contractor will remove the word "etc." from the LCAR. The response therefore is acceptable.

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Office of Safety Regulation of the River Protection Project Waste Treatment (RPP-WTP) Contractor	**OSR Review Team Preliminary Questions for BNI**
Question #: 01-LCAR-029-Q	**Date Opened: 6/19/01**
Place "X" if answering "yes":	**Date to Contractor: 6/19/01**
Protection Information? ___	**Date of Response: 7/3/01 and 7/19/01**
Proprietary Information? ___	**Date Closed: 8/9/01**
Team Accepted? _X_	**Reviewer: L. Miller/J. Polehn**

Description:

Review Guidance: Section D, Information Required in the LCAR, item 5 states, "BNI should provide a complete description of all LCAR activities for which authorization is requested. This description should include the following: 5. Engineering and design criteria (including SRD safety criteria) applied to excavations for permanent facilities)…and the basis for selection…"

LCAR Reference: Section 1.3.2.2, Fencing states, "Permanent and temporary fencing will be installed. The permanent fence will be a standard industrial fence per the Safeguard and Security Plan requirements. The fence is to provide protection against damage, destruction, or theft of property….The fencing is therefore not designated as ITS."

Question: With regard to the fencing and its location, how will BNI integrate the fencing and its location into the design criteria to distinguish between the worker and the co-located worker to assure the WTP meets the SRD SC 2.0-1 Radiological Dose Standards?

Contractor Response:
The location of the facility fence is not a limiting factor from the standpoint of the accident analyses for the following reason:

Accident analyses, both for Severity Level determination and for DBE analysis, base their conclusions on potential exposures to hypothetical receptors at "limiting" locations. These assumed locations are "limiting" in the sense that the calculated maximum exposure to a receptor at that location has a very high probability of exceeding exposure at all other potential locations of the population to which the receptor belongs.

The limiting facility worker is generally assumed to be located as near the location of the event (i. e., release) as is reasonable in the context of the development of the event. (See K70DG715, Section 2.1). His population group is defined as being within the WTP controlled area (i. e., the fence), but the actual location of the fence is irrelevant to establishing the definition of "limiting" with respect to the facility worker location. Likewise, his belonging to the population group defined as "facility workers" influences the type of controls used for his protection, but again the actual fence location is not important.

The co-located worker population is defined as being outside the WTP controlled area boundary and within the boundary established for potential public occupation. The limiting co-located worker location (from the standpoint of ground level releases) is defined as being a minimum of 100 meters from the release in the compass direction of the highest calculated dispersion coefficient (calculated using assumptions set forth in RegGuide 1.145). This definition does not depend on fence location. It is true that there may be "co-located worker" locations nearer than 100 meters to the facility, depending on the location of the fence. However, the 100 meter minimum is a calculational restriction of the dispersion equations, is generally used in the DOE complex for establishing maximum potential exposure to co-located workers from accidental releases, and has been accepted by the OSR during their review of our radiological consequence methodology document (now K70DG715).

Question 01-LCAR-029 (Supplemental)

Contractor Response:
As discussed in a meeting on 7/13/01 between BNI and OSR, there are locations west of the WTP controlled area within 100 meters of the HLW and P T buildings. It was recognized that Gaussian plume dispersion models would not be valid for these distances since they are less than 100 meters. Using a 100 meter distance to calculate this co-located worker dose slightly under estimates the dose received and is potentially non-conservative. Even though it is anticipated that the mitigated dose to such individuals will be well below the Radiological Exposure Standards, BNI will establish administrative controls to ensure individuals outside the controlled area fence and within 100 meters of the HLW and PT buildings will be evacuated in a timely manner in the event of an accident (either at HLW or PT), thereby reducing their exposure even further.

Disposition: The reviewers requested that the Contractor clarify (01-LCAR-029-Q) how the Contractor will integrate the WTP site fencing, identified in LCAR Section 1.3.2.2 as "not designated as" important-to-safety, and its location into the design criteria to distinguish between the worker and the co-located worker so the SRD SC 2.0-1 Radiological Dose Standards are met. The Contractor's responses indicated, "Even though it is anticipated that the mitigated dose to such individuals will be well below the Radiological Exposure Standards, BNI will establish administrative controls to ensure individuals outside the controlled area fence and within 100 meters of the HLW and PT buildings will be evacuated in a timely manner in the event of an accident (either at HLW or PT), thereby reducing their exposure even further." This approach is acceptable to the OSR because the cited facilities are the only ones that have areas outside of the fence yet within 100 meters of the release sources that the co-located worker could access. Also, the responses provide information specifying how the design will approach the issue.

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